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THE PRACTICAL TEACHER'S ART MONTHLY

Vol. XXVIII. No. 12. JUNE, 1908. Price 6d.

Notices to Correspondents and Subscribers.

"THE PRACTICAL TEACHER" may be ordered of any Newsagent or Bookseller, or at any Bookstall, in the United Kingdom or in the Colonies. Supplies are sent monthly to the chief towns in Australasia, South Africa, and India.

LONDON OFFICE: 35 and 36 Paternoster Row.
EDINBURGH OFFICE: Parkside Works.
DUBLIN OFFICE: 17 Talbot Street.
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Subscribers may obtain "THE PRACTICAL TEACHER," post free, from the Publishers at the following terms:—

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All literary communications should be addressed to the Editor, Office of "THE PRACTICAL TEACHER," 35 and 36 Paternoster Row, London, E.C.

Remittances, Cheques, Post-Office Orders, etc., should be made payable to THOMAS NELSON AND SONS. Advertisement rates on application.

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Educational Opinion.

A WARM and a hearty welcome to our comrades from the West who are soon to cross the Atlantic on a visit to these islands! Mutual understanding is the basis of mutual sympathy and esteem, and no better way of promoting a solid friendship between the two great sections of the English-speaking race could have been invented than this happy interchange of intercourse between the teachers working on the two sides of the great western ocean. It is a truly felicitous idea, and the prime movers therein—Mr. J. Bruce Ismay and Mr. Alfred Mosely—are to be congratulated sincerely on their happy inspiration. To the teachers concerned these visits will be a refreshing and vivifying experience whose full fruition will be seen in its influence on the countless youngsters of whom they have the charge. To the nations at large, who shall pretend to estimate the future worth of this happy commingling of minds, all devoted to the same object—education?

A Welcome.

* * *

ARRANGEMENTS are proceeding apace. Committees are working in the States and Canada, selecting teachers for the visits, fixing itineraries, laying down programmes of study, and generally placing all the necessary preparations on a sound business footing. The visitors will inspect British universities, colleges, public schools, county and municipal secondary schools, girls' and mixed schools, training colleges and art schools, polytechnics and technical schools. But the chief aim of the tour is the observation of the primary, secondary, and technical systems, manual training, and the training of teachers; and the groups of visitors are to be chosen from teachers already engaged in these various branches of educational work, so that the greatest benefit may be reaped from their observations. There is a solid air of business-like purpose about the organisation which augurs well for the success of the tour; and from a bundle of American educational journals just to hand there is abundant evidence that interest in the venture is almost universal.

Our Visitors' Plans.

* * *

NEW YORK is very much to the fore. The National Civic Federation, a body deeply interested in trade and industrial education, is selecting some five hundred teachers to travel, and a committee of the Federation, headed by Dr. Butler, the well-known President of Columbia University, New York, is hard at work on all the details of the trip. We like the sanity and sober restraint of the remarks made by the committee in its circular of information. "They [the teachers] may find much to imitate, and possibly some things to be avoided, but their increased experience cannot fail to be helpful in the development of our school work." That is just the right spirit in which to investigate. No nation holds the "philosopher's stone" of education, and methods must be adapted to conditions. Your worst of critics is the one who takes *omne ignotum pro magnifico*. In the long run he brings discredit on the thing he so unintelligently admires. But your Westerner has a way of bringing very clear eyes and fresh views to bear on any subject, so that even in those "things to be avoided" we hope that we ourselves may gain much from friendly criticism.

Look out, Britishers!

* * *

PRESIDENT BUTLER'S committee contains some of the best-known names in American education, drawn from the length and breadth of the States—a certain proof of the interest taken in the project. And on this side of the "ditch" Mr. Alfred Mosely's Committee of Reception shows already a long list of prominent men, representing the universities, colleges, schools, science, art, politics, and the educational authorities of the country. In addition, there is the informal Committee of Welcome, in the persons of the English teachers who spent the winter of 1906–7 on the other side of the Atlantic, all eager to do their utmost to make this return visit interesting and profitable. The auguries are very favourable. Nothing seems wanting to make this tour a memorable event and a lasting success.

Notable Committees.

* * *

IT seems a curious paradox that Rousseau should be studied as a great educator, his theories discussed, his innovations admired, and our obligations to him registered, and when you put the theories into practice—the magistrate's court! Yet that is what happened in North-West London the other day. Hampstead would none of Jean Jacques, and a father of nine, who was bringing up the said nine in the most approved Rousseauite manner, was promptly haled before the magistrate for daring to be original in his way of educating his family. His arguments that education should be a delight and not a bore; that children should not learn to read till their minds were stored with ideas, and they felt the desire to read; that their life up to ten or eleven (Jean Jacques said twelve) should be a healthy, outdoor, animal existence, can be heard any day in the lecture-rooms of any training college. Yet he was bid fall in line with the multitude who send their babies to school at three years old, the aforesaid babies learning to read at five, when they have few or no ideas, and no desire at all for the exercise.

Rousseau in Hampstead.

* * *

WE wonder what would be the punishment for the unhappy lecturers in training colleges who regularly imbue classes of students with the ideas of Rousseau, Froebel, and Pestalozzi, were they ever to be denounced; for they are equally in fault with the father of nine. But the workaday world, with its conventions—and, alas, the educational workaday world also—soon play the part of the London magistrate, and squash the Rousseauite ideas of budding teachers. The Hampstead magistrate and the school attendance officer—who had apparently never read *Émile* — were as much nonplussed by the Rousseauite system as the railway porter when he tried to classify a tortoise for freight charges. "Cats is dogs," said he, "and rabbits is cats; but this is a hinseck." And the officials came to the conclusion that education *à la* Rousseau was an uncanny pedagog-

"Émile" dis-countenanced.

ical "hinseck," and treated it accordingly. Curiously enough, it was in Hampstead that Sir Walter Besant lived, part author of a fine novel in which was perpetrated an ironical skit on modern education, in the person of a delightful girl character, of great intelligence and charm, who had never learned to read or write!

THE reformed spelling crusade is not yet dead, although we have heard little of it lately. The Carnegie Spelling Board, which is still "sitting," has hatched out a new batch of seventy-five "reformed" words, undaunted by the derisive reception given to its last batch of three hundred. The *School Bulletin* gives the following amusing specimen of the appearance of the language as "reformed" by the Carnegie spellers:—

"Carnegie" Spelling.

"It was autum. A yoman of the gard looked over the redout, a leag from home. His lims were num. His tung was thick. His thums aked. It was a solum moment. The docil yoman shid, 'I'll get a furlo.' 'No,' said the hostil captain, 'not till the end of the foren campain.' The yoman stood agast and dum. At last he said, 'I have had no lam chops, coco, nor egs this autum.' 'An awful forfit,' remarkt the captain. 'You should send your fotograf to the papers. You look like a gost.' At this harang the sensitiv yoman walkt away thru the ranks, threw away his pocket sissors, shaved himself with a sithe, and risked his life in a gastly manner at the head of the colum."

THE opening of training colleges in London goes on gaily under the London County Council. Two more colleges are announced, temporarily located in Fulham and Moorfields till the time when permanent buildings in the north-west and north-east divisions can be provided. But the list of applications for places in already existing colleges is so large that we doubt whether these new institutions will do anything to satisfy the crowd of applicants from the country at large desiring the advantages of a college training. They will do little more than supply places for the surplus of applicants from the London district. But if colleges spring up at this rate, the "dearth" of teachers will soon give place to a violent competition, with the usual results of keen competition—cutting prices.

More London Colleges.

FROZEN Easter produced one warming experience. The writer was passing through Malmesbury, and spent the time of one of the blizzards in exploring the abbey, guided by the sexton, a delicious specimen of the tribe. From the ruined transept he pointed to the stream where the monks used to fish, and to the sloping bank on the opposite side where they had a vineyard. "They say," he continued, "that the Dook of Clarence was drowned in a butt of Malmesbury wine, but whether it was this Malmesbury or no, 'istry don't say!" Calling attention to the sculptures round the great southern entrance, in which the eye of an enthusiast was required to distinguish anything at all, he pointed to one almost indecipherable group. "That," said he, "is our Lord between the two *manufactures*." Over the tomb of Athelstan he waxed eloquent on the fighting qualities of the Malmesbury folk, who drove back the Danes advancing from Southampton. For this Athelstan gave 800 acres of land to be divided among the freemen of the town. "You puts in your claim," said he, "and the mayor gives you a twig and a turf, saying,—

History in Wilts.

'Twig and turf I give to thee,
The same as Athelstan give to me.'

My share is an acre and a quarter. Thank you, sir." Bravo, Malmesbury!

WAR to the knife against Greek letter fraternities is declared in America, as we have before noted in these columns. The latest fulmination comes from Chicago, which adds sororities (a horrid word for sisterhoods) to the things banned. No quarter to the brothers and sisters. "Any pupil of the high schools of Chicago who is a member of one of these secret (!) societies shall be suspended." So orders the Board of Education of Porkopolis. At this distance it is difficult to understand all the fuss made about these fraternities, but from the increasing rigour of the pronouncements concerning them, we infer that their secrecy is a detriment to the discipline and work of the American schools and colleges. So far England has been spared this infliction, though we have a college lingo which ought to keep us humble.

Fraternities and Sororities again.

THE American *School Journal*, which has just reached us, gives the following delicious "howlers" from examination papers: "William Mantlepiece Thackery; Kipling's *Jumble Book*; Wordsworth's 'Ode on Imitations of Immorality.'"

Literary Discoveries.

THE NEW ENGLISH MOVEMENT.

SUGGESTIONS FROM AMERICAN SCHOOLS.

BY W. H. WINCH, M.A.

II.

WHAT is read in American schools? And how are the children taught to read? There is considerable agreement in the answers that would be supplied to the first question from whatever States or whatever schools the replies were obtained. But to the second question there is as great a variety of answers as is given by the educationists of our own country.

A Chicago principal said: "Our method of learning reading is a *word* method. We learn it without analysing it into its component parts. Some go further, and advocate a *sentence* method." An opponent wittily said that he should prefer a *book* method; he could soon teach a child to recognise a book when he saw it. It would not be teaching reading, but it would, he thought, be less fatiguing. English teachers will at once identify this with what we used to call the "look and say method," but it is not always quite so simple as that now discredited system. In one of America's excellent training colleges—her normal schools are really schools of training in teaching—I heard a lesson given in the ordinary course of things—not, be it understood, prepared for me to hear—which will make clear to English teachers what the *word* method may be.

BROOKLYN, NEW YORK STATE. TRAINING SCHOOL FOR TEACHERS.

Thirty-three girl students were present, of an average age of eighteen and a half years.

How to Teach Reading to Beginners.

This was what we should call a "criticism lesson." All the students had prepared it, and one had been selected by the teacher to give it. The rest of the students sat at their desks, and tried to act intellectually, as if they were little children in Grade I. (A) ("A" in New York means lower division) just beginning school.

The mistress of method made a few preliminary observations as to the sort of criticism which the students would be expected to offer. "Your criticism," she said, "should take note of the use of the blackboard, the scope of the lesson, the method of the lesson. Under this latter head, note whether a concrete or abstract method is adopted, whether one point is thoroughly done before the next is attempted. Remember that we must 'drill' thoroughly. Notice also the *manner* of the teacher and the children. If you are a good critic, I shall take it that you can do the thing yourself. Be as helpful as you can during the lesson, without forgetting that you are Grade I. children."

This well-spoken little address was carefully listened to, and the girls sat expectant, with critical eyes, though with smiling lips. The word "drill" struck me with a little shock (we dislike the thing so much that we now call it physical exercises), but I found later that its use in America is spread over the whole educational field: there are "drills" somewhere in most subjects of instruction.

But I fear I am unduly interpolating between the student and her simulated Grade I. pupils. The children were supposed to know a few words: these were to be used, and a new one introduced. The student came before the class with quiet confidence and exhibited a little picture. Then she told a little story about it, and followed with questions.

Teacher. Are you going to be good?

Pupil. I am going to be good.

Teacher (to a second pupil). Are you going to play?

Pupil. Yes, I am.

A real Grade I. pupil would have said, "I am not;" but the required word came in, so all was well.

Teacher (to a third pupil). What is the new word?

Pupil. Am.

Teacher. I am going to put the new word on the board.

This she did many times in writing of different sizes, sometimes very large and sometimes quite small. Pointing to each of the words written, she questioned, "What is this?" and was answered individually by different pupils, "Am," "Am," "Am," "Am," "Am." This was drill, and went on for a minute or two. Teachers who are psychologically minded will see that the many writings were used to eliminate size as a factor in recognition.

Then, pointing to the word "boy," which she had also written on the board, she asked, "What is this?"

First Pupil. I don't know.

Second Pupil. I don't know.

Third Pupil. I don't know. It isn't "am."

Teacher. Now, children, come and point the new word out.

Seven students, selected by the teacher, did this, one at a time, and returned to their seats.

Teacher. Some little girl come and write it.

Could, I ask, a class of Grade I. (A), just beginning to read, be expected to write it? An eighteen-year-old student could and did do so, and the question was not raised either then or in the criticism which followed the lesson.

Teacher. Underline the word with this yellow chalk

On the board were now written—

and *am*

am

am *boy*

Teacher. Come and rub out all the words but "am."

Then she held up six cards with "I," "am," "boy," "and," "do," and "eat" written on them, one behind the other, so that only one card with its one word could be seen at a time. "You are to say the new word as it comes along," she said, taking one card from the front and putting it at the back. Then the cards were spread out and stood upon the frame of the wall-slate. "Now I'm going to hide the new word." "Close your eyes," said the teacher as she changed its position. "Who can find it?" "Now say all the words. The first row stand, and say them one at a time." "Suppose," said I, "they do not know the other words. We saw above that 'boy' was not supposed to be known." "We pass on just the same all round the class," said the mistress of method.

"I am now going to use the new word in sentences," said the teacher, and she wrote:—

I am at home.
Here I am.
I am a good boy.
I too am good.
Yes I am here.
Tell Frank that I am here.

"How many can read the first sentence and say what is the new word?"

"I want to have the new word underlined in each sentence. What is it?"

When this had been done the student-teacher concluded with the words, "I hope you have all learned the word 'am.'"

(Exactly twenty minutes had elapsed since the commencement of the lesson, and with real Grade I. children the time occupied would have been longer.)

The first student called upon to criticise said: "I think this a good lesson, and the picture was well used, but it was a very little picture for a large classroom. The answer to the question, 'What is the new word?' might have been the word 'good.' (The teacher had, consciously or unconsciously, emphasised the word she wanted in answer.) One pupil would have rubbed out the smaller word 'am' if you had not left 'am' very big in the middle of the board. That should not have been done."

The teacher of method interpolated for the first time, and said, "No; let them have all the help you can."

The critic continued: "Her voice and manner were interesting. The blackboard was well used, and the cards on which the words were written were good, and too stiff to bend about."

We all thought the student had used the method extremely well, and her manner had delighted every one of us; but as to the method itself I did not feel so certain.

The lady principal of this college had complained to

me that many very modern methods were elaborate devices for teaching nothing. Can we be quite sure that this method is not likewise too full of procedure and too empty of result? Many of the steps were simply devices for attracting attention—for example, the underlining, the running out to the board. These, with good discipline and control, are wasteful of time and probably unnecessary. The writing of the new word seemed an excellent thing so far as it was practicable: it would tend to fix attention on the several elements of form (or letters) which constituted the word. There was no attempt to analyse the sound "am" into "ă" and "m." The sound "am" is, of course, simpler to children of this age (six years) than "ă" and "m" separately. It was excellent, if it was necessary, to vary the size of the word when it was written several times, and to mix it up with other words and then require its identification. This hide-and-seek method, with the children shutting eyes whilst the teacher moved the word, would delight the little ones. But assuming that every child did learn to know it, it took twenty minutes to get this done, and it was not then known in any analytic way. I cannot, however, in the absence of timed experiments conducted by this method on classes of known ability, come to any certain conclusion, negative or positive.

All my readers will, I think, agree with me that the lesson is very interesting, and contains suggestive elements of great value to us, even if we do not use them for the purpose of teaching reading. And if writing is to be taught concurrently with reading, why should we not, like many American schools, begin with script in our reading lessons, and not with print?

"So that is the way reading is taught in America," I hear my reader exclaim. No, I don't think the method as here outlined has very much vogue at present. Even in America the method of the school is not the same as the method of the training college, and not very many of those adopting the "word method" support it by so many good collateral devices as this teacher did. This is the *word* method at its best.

In my next paper I will take a few more typical cases before attempting to generalise.

(*To be continued.*)

THE PICTURE POST CARD IN THE SCHOOL.

BY EDWARD PAINE, A.C.P., ST. PAUL'S CRAY, KENT.

IT is now recognised that geographical teaching on the old lines is obsolete, and that lessons on this subject must appeal strongly to the eye as well as to the ear.

H.M. Inspectors right and left are recommending more illustrations, and publishers have produced some splendid wall sheets and beautifully illustrated readers. All these, however, pall and get familiar after a time, and it is then that the mine of hidden wealth that there is stored up in picture post-cards for illustrative purposes can be utilised with advantage.

The methodical use of these aids has been a thing of slow growth, partly, no doubt, because picture cards have appeared more adapted for personal and social uses, and partly from the difficulty experienced in the actual presentation of these useful adjuncts before the class.

After a good deal of experimenting with various methods of showing cards to a group of children, I have found that a frame to hold 16, 20, or 24 cards gives the best results with a minimum of trouble.

The frame is made exactly as hymn boards are made for churches, and almost any teacher could make one satisfactorily. A penny tin of paint will give a glowing colour and hide imperfect joints. If the work is too difficult for home carpentry, the local joiner will make an excellent article for about half a crown. This frame is used exactly in the same way as the boards before referred to. Cards are put in and taken out at the sides. After the lesson is over the cards are always taken out. In this way interest is maintained, and the cards are preserved.

The subjects that we have been able to illustrate best are geography, history, current events, and nature study. For geographical purposes, indeed, there is such a variety of views to be obtained, that the difficulty lies not in the provision but in the wise selection of typical illustrations.

In this group the scholars themselves have been most willing helpers, and even parents have occasionally sent exceptionally fine cards for exhibition, which all tends to create a good feeling between the teacher and his pupils and their relatives.

I might, perhaps, also mention here the possibility of the teacher who uses a camera making great use of his own cards, both local views (these are always appreciated) and mementoes of his holidays. To show the lines on which lessons may be planned, we will just take three groups. Standards I. and II. are learning that high lands are the birthplaces of rivers. Then in our twenty cards we shall show first one or two mountain views, snow-capped, cloud-capped; then the mountain streamlet falling over the rocks; then the meeting of the little rills, a weir, salmon fishing, a lake, and thus gradually trace the descent of the water, ending with the little tower-crowned harbour, and all the time the clouds and mountain-tops are in view, and show cause and effect.

Or, again, a higher group are being taught the importance of some particular town—for example, Yarmouth as a fishing port. Then we have the town arms, views of the sands, the pier, the rows, the quay, women barrelling herrings, drying and mending nets, the start of the fishing fleet, a storm, the lifeboat, and a picture of the famous monument in Caistor churchyard.

Or take current events—for example, the University Boat Race. We have a set of cards giving the colours and flag of each college, pictures of house-boats, locks, Iffley Mill, Folly Bridge, and many others, ending up with illustrations of the event itself. These shown to an upper group, who are to write an essay upon the subject two days afterwards, ensure far better results than any amount of mere verbal description.

There are several series of cards that the teacher, young or experienced, may well collect and use, even for his own pleasure. One specially magnificent set is that showing the coat of arms used by various towns.* The ingenuity displayed in the arrangement of the various subjects on the crest itself, the meaning of the motto adopted, as well as the brilliancy of the colouring, render them specially interesting. Take, for instance, two perfectly dissimilar examples, those of Devonport and of Birmingham. In the former we have figures of two dolphins with an anchor between, below a crown,

* The series does not bear the name of the publisher, but most dealers will be able to supply.—ED.

then a mailed head and shoulders, then another crown with two oak branches crossed, and lastly the ribs and keel of a ship, with the motto, "Prorsum Semper Honeste." Is it not clear that a view of all this will help a child to realise vividly that "Devonport is a royal dockyard town"?

The Birmingham arms are a bared arm with hammer resting upon a crown. On one side stands a burly smith with hammer and anvil, on the other a female painter with palette, showing the connection between art and industry, and beneath the motto, "Forward."

For nature study there are splendid photographs, which cannot be mentioned in detail in this article, and also in other subjects the choice is bewildering; and no teacher who gives picture post cards a fair trial will ever regret having introduced both an interesting and effective educational aid.

THE TEACHING OF LITERATURE.

Special Notice.

The Editor has been repeatedly asked for more definite help in carrying out within the walls of the classroom the ideas promulgated by the promoters of the New English Movement. He has therefore made arrangements for a series of articles, in which an attempt will be made to show what can be done in each of the standards of the ordinary primary school, and even in the infants' school. Next month he hopes to publish two papers, one by Miss Clara Grant of Devons Road School, Bow, E., a member of the Committee of the English Association, the other by Mrs. Florence Kirk of Bradford, both dealing with "The Literature of the Infants' School." The following number of the *Practical Teacher* will contain a paper on the literature lesson of Standard I., and the series will be continued month by month until the entire work of the primary school in this important subject has been adequately covered.

AN EXCELLENT READING BOOK.*

MR. EDWARD ARNOLD sends us a literary reading book for junior forms and higher standards which it would be difficult to praise too highly. It consists of readings in prose and verse drawn from first-class literary sources, and provides an introduction to imaginative English literature of the best possible kind. The prose extracts are all of a narrative character, while the verse is alternately lyric and descriptive. The volume is beautifully illustrated with reproductions of pictures by great or competent artists, for the most part aptly chosen—for example, Davis's "Mother and Son" makes an excellent companion to the tale which tells how Hereward won Mare Swallow. An attractive feature is an interesting selection from the "Riddles of Cynewulf." The book has one fault, which it shares with the companion volume, *In Golden Realms*. It is somewhat unequal. Passages from *Alice* and the story of *Snowdrop* from Grimm are not on the same level as the rest of the book. Further, the volume is handicapped by its title, which is unfortunate. For it is just because it does *not* consist of literary splinters that this new and very attractive reading book will be welcomed by all who march in the van of the New English Movement.

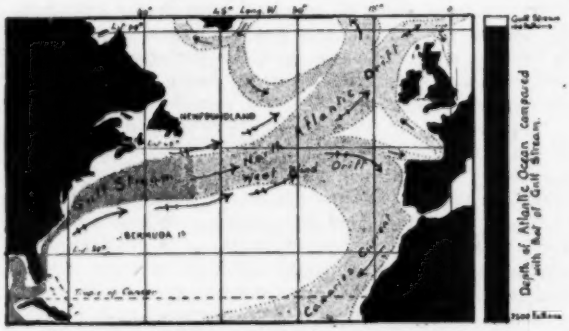
* *Chips from a Bookshelf*. An English Reading Book for Junior Forms. Edited by H. B. Browne, M.A. Edward Arnold.

GEOGRAPHY NOTES UP-TO-DATE.*

BY E. R. WETHEY, M.A., F.R.G.S.

The Gulf Stream Myth.

THE dreams of our youth die hard. So do certain persistent errors in geography, and surely none die harder than the famous myth that Western Europe owes the mildness of its climate to the proximity of the Gulf Stream. Notwithstandng the investigations of scientific expeditions, such as that of the *Challenger* in 1873, the writings of first-class authorities—such as Dickson in the ninth edition of the *Encyclopædia Britannica*—and the publications of such up-to-date scholastic writers as Mill, Herbertson, Lyde, Mackinder, Gregory, and the Americans Gilbert and Brigham, the old theory still holds sway, not only, of course, in the older text-books, but in some otherwise excellent treatises of current date. In one of 1907 the author speaks of the important part played by the Gulf Stream in moderating our climate: "Its mild waters lave our shores and make our climate much milder than it would otherwise be"—in fact, give Edinburgh an average winter temperature of 37° F., while Venice, far to the south, has to put up with one of 35°. A writer in the *Times* of May this year, under the heading of "The Cornish Cliffs in Spring"—an excellent article, by the



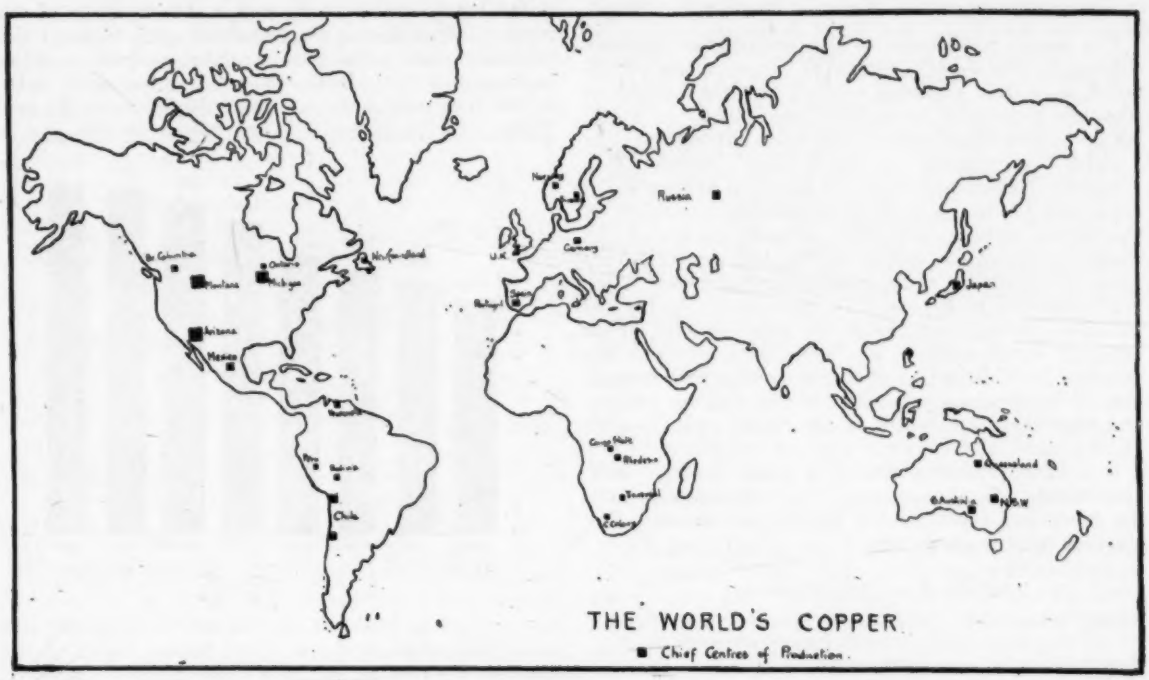
THE GULF STREAM AND THE NORTH ATLANTIC DRIFT.
⇔ Direction of the general drift of surface waters over the Atlantic, quite apart from the Gulf Stream.
→ Direction of the chief offsets from this drift.

way—says: "It is this direct exposure to the warmth and moisture *which blow in from the Gulf Stream* and the wide fields of the Atlantic which gives the cliffs of Southern Cornwall their peculiar richness of vegetation." And that many teachers are still basking in the dreamland of the good old times an experience of public examinations and examiners, ranging over all school ages, tends sadly, but withal obstinately, to prove.

It is time, then, that some one once more adduced the refutation of the myth, and established the reign of its successor.

What are the known facts relating to the Gulf Stream? Summarising investigations, and without going into causes, we find that it is a warm body of water which issues from the Gulf of Mexico through the Florida Strait. From that point to the longitude of the Bermuda Islands, though it probably varies both in rapidity and volume under seasonal and meteorological conditions, it is some

* The Editor apologises for the following errors in Mr. Wethey's Notes which appeared last month. In the paragraph on the Kentish hop the expression "£10, 15s. the cwt." should read "£10 to £15 the cwt."; and under the heading "Farewell the Rocky Mountains," the word *Geographic* should be *Geographic*.



50 miles wide and 100 fathoms deep, travels at the rate of 50 miles a day, is very salt and very blue, and has a temperature of 80° F. While in this condition—in its prime, so to say—and in these regions, it makes its presence felt. Witness the coral growths of the Bermudas, the most northerly coral islands in the world. The *Challenger* hereabouts—to be precise, in lat. 35° 58′ N., long. 70° 39′ W.—found that the temperature of the surface water suddenly jumped from 64° F. to 71° F. as the Gulf Stream was entered from the south side, that it rose to 76° F. as the centre was reached, and that it fell to 66° F. as the current was left on the opposite side. Now, undoubtedly, if these conditions were maintained right across the Atlantic, the old theory would stand. But they do not. Some little distance to the east of the longitude of Eastern Newfoundland the Gulf Stream as a *warm current* dies out. That is to say, that, 1,500 *miles from the shores of Europe, this so-called "beneficial ameliorator" is absolutely indistinguishable in "set" and temperature from the rest of the ocean.* The depth has by this time dwindled to fifty fathoms; it has become, literally, a drop in the ocean. It can hardly be said therefore even to *touch* Europe. And yet we are required to believe that this tiny remnant of what at the best was a mere rivulet—100 fathoms deep over a depth of 2,500, 50 miles wide in 2,000—can work such wonders as the phenomena of our Western European climate.

As a matter of fact, the Gulf Stream is a mere part, a fraction, of the whole. It is a symptom, so to say. The same cause which produces the Gulf Stream produces at the same time "the great oceanic whirl of which the Gulf Stream forms part" (Mill, *International Geography*, ed. of 1907, p. 708). The result of the prevailing westerly and south-westerly winds—plus other causes, of which different salinities and the excess of easterly momentum are the chief—is that first there is a general movement of warm surface water north-eastwards across the Atlantic and secondly that this water is heaped up to a great depth (40° F. down to 900 fathoms) off the shores of Western Europe. The same winds which have effected this pass on, carrying with them the warmth and wet which are characteristic of our British climate. But what of the "rivulet"?

Its case could not be better stated than by quoting the two following up-to-date and well-accredited authorities. Mr. H. N. Dickson (*Quart. Jour. Meteor. Soc.*, vol. xxv., 1889) says: "The mild winters of our western coasts are not due to the heating of the air by contact with a surface of warm water brought by a current from warmer regions.....but to the fact that the air has itself come from these warmer regions, and is charged with abundant moisture, which sets free vast quantities of heat through condensation. With the south-westerly winds comes the drift current, and the temperature of the water is higher than that of the air, because both are moving northward and the specific heat of the water is the greater; but the warmth of the air and of the water are both the result of the prevailing direction of the wind." Mr. H. J. Mackinder (*Britain and the British Seas*, ed. of 1907, p. 166) says: "The winds from a relatively warm ocean, and the latent heat set free by the frequent rains, are the causes of the mildness of the western winter." And then in a footnote he adds: "This warmth is not due to the Gulf Stream, as is commonly stated. That very definite current..... ceases to be distinguishable a little to the east of the Newfoundland Bank, fully 1,500 miles from the nearest shore of Britain. The warm water west of Britain is due merely to the general north-eastward drift of the ocean surface, propelled from latitudes in which the sunshine is powerful by the winds and by differing salinities."

Teachers therefore will be well advised if, in dilating on the Gulf Stream, they keep it in its proper place, and at any rate substitute the term "North Atlantic drift" when they approach the subject of climate and its causes in Western Europe.

Copper: The World's Output.

The recent publication of the remarkable statistics relating to the world's output of copper seems to demand more than a passing notice. It gives teachers of economic geography an excellent opportunity of bringing up-to-date their notes on the most important of the "useful," as opposed to the "noble," metals. The demands of tubes and pipes, of electrical apparatus, of brass and bronze, and of the industries dependent on the various copper salts, have actually compelled the world to double its output in the last ten or fifteen years. One hardly realises the omnipresence of "copper" until one makes a simple experiment. Count, for instance, the different kinds of brass articles in an ordinary sitting-room: one soon runs up into the twenties and thirties. And then remember that a single firm in Birmingham will make 30,000 *different* articles, and that there are scores of such firms—which, after all, is a mere incident in the world of copper.

It is lucky therefore that the metal is one of wide distribution. In the accompanying diagram map only the more important mining centres are shown. The places indicated are as follows:—

1: *The Ten Chief Countries.*

United States	Montana (Butte), Arizona (Bisbee), and Michigan (Keweenaw).
Mexico	Zacatecas.
Japan	Ashio.
Australia	New South Wales (Cobar), South Australia (Moonta and Burra Burra), Queensland (Cloncurry).
Spain and Portugal	Rio Tinto and Tharsis; Alemtejo.
Chile	Coquimbo and Arica.
Germany	Harz Mountains (Mansfeld).
Russia	Ekaterinburg.
Canada	Ontario (Sudbury), British Columbia.
Peru	Cerro de Pasco.

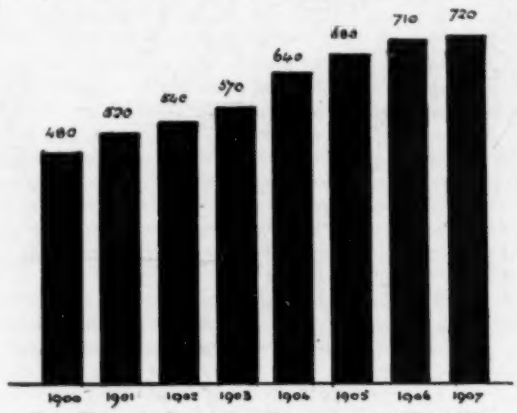
2. *The Minor Countries.*

Norway	Röros.
Sweden	Falun.
United Kingdom	Cornwall and Devon.
Bolivia	Corocoro.
Venezuela	Aroa.
Newfoundland	Placentia Isthmus and Tilt Cove.
Transvaal	Pietersburg.
Cape Colony	O'okiep.
Rhodesia	Broken Hill.
Congo State	Katanga.

The Growth and Expansion of the Copper Industry.

The immense increase of the world's output of copper corresponds closely and naturally with the great development of the iron and steel trade of the last twenty or thirty years. And with the increased demand have marched improvements in methods of extraction which may be said to have revolutionised this branch of the industry. Ore over in Michigan is now fed into a cupola in the morning and shipped as "99 per cent. bars" in the evening—an operation which formerly took four months to complete. Thirty years ago it took a ton of coal in Colorado to smelt two and a half tons of copper ore; now the same works make the ton of coal smelt nearly four tons of ore. Even old-fashioned reverberatories will smelt fifty, where they used to be satisfied with twelve, tons of "charge" a day. The newer type of furnaces would not rest with less than two hundred. There are some which will put through five hundred.

The total result is to be seen in a comparison of the copper output figures for 1900–1907 with those of the preceding years. The world's annual production at the beginning of the nineteenth century was well under 10,000 tons, and it did not reach 50,000 until the late 'fifties. In the 'seventies it first passed 100,000, and in



The World's Output of Copper from 1900–1907.
(Figs. = thousands of tons.)

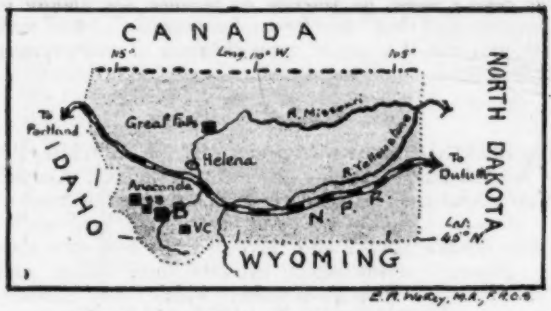
the concluding years of the century it averaged just about half what it is now. The figures shown in the diagram are rounded off from those recently published by Messrs. H. R. Merton and Co. The exact amount for 1907 is 716,435 tons.

The change in the comparative importance of the countries supplying the copper is quite as striking as the change in the aspect of the figures of supply. For years Russia was the main source of supply for Europe. Then came Chile in the early 'sixties. By 1867 Chile was responsible for 70 per cent. of the world's output, and it was still leading in 1880. But its "out-of-the-way" geography, and the great discoveries of the United States and Mexico, effectually relegated Chile to the background, and it has now to be satisfied with the sixth or seventh place. There was a time, too, when the United Kingdom looked largely to Cornwall and Devon for the raw material of its copper industries. A variety of causes has reduced this industry almost to extinction. Mines getting deeper or working out altogether, emigration of miners to more promising lands, "royalties"—the bane of much mining in the old country—and, above all, successful foreign competition, are the chief of these causes. For what could the few thousand tons raised by Cornwall even in its prime effect in competition with the hundreds of thousands raised by the United States? Nothing is more striking in the figures of the world's total than the preponderance of the United States output—nearly 400,000 tons, or considerably more than 50 per cent. Add Mexico, second on the list, *longo intervallo*, with its 57,000 tons, and you have over 60 per cent. of the total supply allocated to these two countries—which, indeed, has been the state of affairs practically since 1900. Of the other ten countries in our first list, only Japan, Australia, and the Iberian Peninsula touch 40,000 tons.

American Copper.

Of this immense American supply three states alone—Montana, Arizona, and Michigan, in the order named—supply between 80 and 90 per cent. The Michigan mines are the oldest, and their copper is the purest in

the States. Until the great development in the Western States these mines turned out 60 per cent. of the States copper: they are now responsible for not much more than 25 per cent. The great locality is the Keweenaw Peninsula (on the south shore of Lake Superior), where



MONTANA, U.S.A., Chief Copper Centres ■

Main line of North Pacific Railroad.

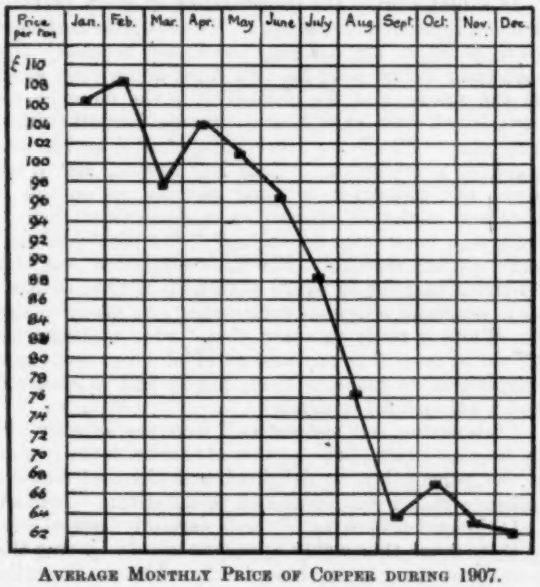
B.....Butte.
S.B.....Silver Bow.
V.C.....Virginia City.

Area of state = 500 × 300 miles.

Mem.—Small size of the map makes Butte City appear to lie in the basin of the Missouri. Really it is over the western watershed at the head of the R. Deer Lodge, which eventually drains into R. Columbia.

some 5,000 men are employed in the famous Calumet and Hecla mine. The Arizona districts are round Bisbee, Jerome, Clifton, and Globe—all in the south and south centre of the state. But the great copper state is Montana, well called the "bonanza" state, prominent on whose arms are a miner's pick and shovel and a retreating buffalo. The Anaconda mine was discovered in 1882, and as the copper ore was there combined with gold and silver the fortunes of the district were assured.

One feature of "American copper" at the present time should not be passed over. The output of 1907



AVERAGE MONTHLY PRICE OF COPPER DURING 1907.

shows a slight decrease on the figures of the preceding year. True, it is but a small one—a mere matter of 14,000 to 15,000 tons, about equal to Russia's total figures. But there it is, and being the first instance of a decrease since 1893, the quidnuncs are much agitated. The explanation is probably simple: copper was steadily falling in price during the last eight months of 1907. Whereas in January "G.M.B." was fetching £106, 10s. per ton, in December it was only worth a paltry £62—a drop of about 42 per cent. in value for the metal. Quite apart from any consideration of American ways of finance in general, or of the Amalgamated Copper Company's dominant position in particular, this fact alone would be sufficient to account for a restricted output. Add to this the unsettled condition of money matters in America and the depressed state of electrical engineering in the United Kingdom, and it looks as if 1908 may even show a reduction on 1907.

THE HASTINGS CONFERENCE—SOME AFTERTHOUGHTS.

BY ALLEN CROFT.

I AM fast approaching the stage when, without undue egotism, I may claim to be an "old Conference-goer." Anyhow, the Hastings assembly was the seventeenth it has been my privilege to attend; and I assert, with whatever responsibility a month's reflection entails, that in my humble judgment it was the least satisfactory of the brilliant series which, in my own experience, began at Leeds in 1892. I do not pretend to understand the reason for this adverse verdict. Almost from the opening session Conference manifested signs of impatience, not greatly removed at times from genuine rudeness; and as the week wore on, ebullitions of gross discourtesy were not wanting, calculated to demoralise completely any save the "old Parliamentary hands." Inchoate rowdiness had more than once to be sternly repressed by the President; and from time to time I found myself asking, "What on earth *would* have happened had not the Conference been hugely decreased in number?" Not far short of a riot, probably—or a mild imitation of it. Truth to tell, the hall was probably the least suitable of any I have entered—and I have not forgotten the happenings in the "greenhouse" at Cheltenham ten years ago. The representatives seemed packed like herrings, no serious attempt (so far as I could discover) being made to separate them from members of the Union, general public, members of Education Authorities, and committees. Many of them could neither see nor hear. They were uncomfortable to a degree. They became easily tired, almost bad-tempered, and quite unable to maintain the lofty tone which characterised the Oxford gatherings.

* * *

"*Literature in the Schools.*"

OF the four sectional meetings, the palm, from a purely educational standpoint, must be accorded that allotted to "Literature in the Schools." I had the honour to preside over this section, not because of any particular knowledge of the subject, but mainly because I happen to be chairman of the Executive's Education Committee; and two happier hours I never spent than in listening to the papers on the subject and the discussion which followed them. I was compelled to extend the session for thirty minutes, so genuine was the interest and so keen the desire of each one present to contribute his quota; and instead

of being in the usual position of patiently awaiting the advent of the bold inaugurator, I was troubled with a rush of competitors for attention.

A REALLY brilliant contribution was the paper read by Mr. J. E. Barton, M.A., headmaster of the Crypt Grammar School, Gloucester; and the following sentence will evince, as well as any other, his keynote: "*In school, as out of school, literature is only known in proportion as it is enjoyed.*" I should like to quote very fully did space permit, so pungent and so pithy were the *dicta* of Mr. Barton. But perhaps the following will suffice to give a taste of their quality :—

Mr. Barton's Paper.

(*a*) "The word literature, properly used, denotes the work of a creative artist, a writer who achieves his effect by no exact and logical process, but by personal contact and a pleasurable appeal to our sympathy. *He writes for pleasure; pleasure is his medium of communication; we only understand him through pleasure; and pleasure is the sole instrument by which we can induce other people to understand him.*"

(*b*) "I believe that literature in schools has been hitherto a failure because we schoolmasters have persistently forgotten that literature is a form of art, and have persistently treated it as though it were a kind of science."

(*c*) "Literature in schools, if not pleasurable, is actually pernicious. Notes to school editions, forced upon tender minds, have often inspired a blind hatred of literature."

(*d*) "It is particularly desirable that for all children, young and older alike, we should rope off some little province of general reading from which all minutiæ such as examiners love are barred."

(*e*) "The power of a teacher to communicate literary pleasure is measurable simply by his own enthusiasm."

Mr. Barton's paper simply bristled with epigram and most delightful persiflage, and yet did not ignore certain practical suggestions. Three of these particularly brought out were :—(1.) *The teacher should use his own voice to much more purpose than at present.* He could sometimes either read personally to his class, or, still better, give in his own words some continuous narrative, such as the Odyssey. (2.) *The teacher should do his utmost to influence the selection of books for home reading.* Mr. Barton, to my great joy, admitted that at a certain age the taste for pirates is a thoroughly sound taste, and was deservedly severe on "that tearful and unctuous type of story which publishers describe as 'wholesome,' and which may comprehensively be defined by the term 'slop.'" Every teacher, said he, in drawing up his list of books, should apply to each book individually these searching tests :—

(*a*) "Is this a book which I myself, when I am rather tired and wish to be amused, can enjoy, honour bright and without humbug?"

(*b*) "Is this book likely to hold the attention of the normal boy?"

(*c*) "Is it a book of sound workmanship, and one which would be awarded some degree of artistic merit by any competent judge of current literature outside the scholastic profession?"

Such tests, applied with intelligence and sincerity, would certainly result in something very different from the customary selection. (3.) Mr. Barton's third suggestion is embodied in the following words: "If school literature is to be genuine literature, and if genuine literature is simply one of the many modes of art in which life has been interpreted, *it seems to follow inevitably that great advantage is to be got by putting before the child's mind, as patently as possible, the affinity of literature and those other forms of expression.*" And with his plea for the use of reproductions of masterpieces only, I think we all concurred.

A SECOND paper was read by Mr. J. A. White, the "Acland" Higher Elementary School, Kentish Town, who took particularly as his theme the inculcation of a love of poetry, and incidentally, may I add, favoured the audience with a few short extracts from Milton and William Watson, which they greatly appreciated. Before detailing his methods of securing a real interest in literature amongst the children, Mr. White stated what he kept in view. Thus :—

Mr. White's Paper.

(1.) "Interest is of more importance than knowledge. Without some knowledge of the meaning of a work, however, I am of opinion that a child will not be interested. On the other hand, I never endeavour to place the whole of my interpretation before him if that interpretation is beyond his experience."

(2.) "Interest is first aroused by detailing interesting incidents about the author and about the times in which he lived, especially those incidents which bear upon the work being taken."

(3.) "My position in the boy's reading is to enable him to grasp the meaning with fair facility."

(4.) "The boy is trained to read by having the passages which form, as it were, the thread in longer works marked for purposes of reading, while the shorter passages for memory work are marked 'Learn.'"

As a hint worthy the consideration of every practical teacher, I quote the following: "To obtain the maximum good, it is, in my opinion, absolutely necessary that each child should have his own copy, and a copy which he can mark; and the cheaper it is the more he can buy. Each boy should also provide himself with a dictionary. Finally, a most indispensable article is a graph or a cyclostyle." Like Mr. Barton, Mr. White urged the utilisation of good pictures as an aid to literature, and then showed us in some detail how he dealt with poems like "Lycidas," "Samson Agonistes," and "Childe Harold." His final suggestion was that a written exercise on every work as it is finished has a most beneficial effect on composition; so much so that Mr. White is ready to assert that "wide reading alone will do far more than any amount of laborious teaching of composition to make it clear, fluent, and expressive." And I am inclined to agree.

"Interesting and instructive" were the adjectives in the original draft of the motion of thanks to the readers of the papers, but so delighted and charmed was the audience that I was compelled to substitute "brilliant and thought-provoking;" and certainly never were epithets more thoroughly appropriate. In leaving this most interesting topic, I need only add that if gentlemen of the same intellectual calibre can be secured for the purely educational sectional meeting, it will easily transcend in importance and interest all its friendly competitors.

"THE Relation between the Primary and Secondary School" formed the subject of two attractive papers by Mr. J. Lewis Paton, M.A., High Master, Manchester Grammar School, and member of the Consultative Committee of the Board of Education, and Mr. R. Lishman, Headmaster, Belle Vue Municipal Secondary School, Bradford, at the sectional meeting presided over by Mr. A. R. Pickles, M.A. With the following sentiments of Mr. Paton all earnest educationists must heartily agree:—

"Primary and Secondary."

> "Whatever the scheme may be on paper, and however perfect its dovetailing, the relations between the two types of schools will not be what they should be unless the relations between the primary and secondary schools themselves are cordial. Any scheme depends for its success on the people who work it. We were rigidly separated until 1902. Too many traces of that separation survive. Now Column B has been swept away. Let it go, and with it all that it connotes."

Mr. Lishman's paper described the method of carrying out the present system of promotion by competitive examination as "fundamentally wrong, though unavoidable under existing conditions," and he continued in clear-cut phrase: "It sets a premium on precocity, which is frequently the forerunner of adult mediocrity, and disregards the psychological truth that different children develop at different rates and at different ages. The error is intensified by the want of correlation between the two types of schools, which are constructed like two water-tight compartments. The primary school to-day is a *cul-de-sac*, and aims at attaining educational finality at the age of twelve or fourteen." Why the boast that "Shakespeare was more widely read and acted in his native land than in Germany" would enable us "to slap our national chest" is one of the little things that Mr. Lishman should like the opportunity to explain.

THE "Hygiene and Temperance" section, presided over by Mr. Yoxall, M.P., seems to have been the least popular of all, and I cannot pretend to feel any surprise about it. Papers were read by Mr. M'Adam Eccles, M.S., F.R.C.S., London, and Mr. Charles Wakely, Secretary United Kingdom Band of Hope Union, and their tone seems eminently reasonable. Some of Mr. Wakely's suggestions, however, seem to be calculated to defeat their own object by their very puerility. Fancy a class having a course of copies such as "Abstinence is safe," "Water is the best drink." On the other hand, "*In vino veritas*" might prove distinctly stimulating.

"Hygiene and Temperance."

UNLESS something miraculous occurs, a year hence will see the production of a weekly newspaper, owned and controlled by the N.U.T. itself. Many of us will view the separation from the *Schoolmaster* with the most sincere regret; but the present directors of the Educational Newspaper Company have, I suppose, fully considered the matter, and decided that the connection is not worth maintaining *on the Union's terms*. The Hastings Conference seemed sound enough on the general question, the one sharp difference of opinion arising on the question of the editorship. As one who was partly responsible for the recommendation of Mr. Yoxall, I unhesitatingly assert that his assumption of the helm—absolutely unsought by him, and accepted only under a stern sense of duty—is vital for the initial years of the paper's existence; and this view I was glad to see ultimately accepted by Conference. Only the loyal support of the 62,000 members of the Union is now required to make of the proposed "organ" a big financial success during its first year.

The New "Organ of the Union."

THE discussions on the balance-sheet and the new "organ" occupied so much of the limited time set apart for purely Union business that it was found quite impossible to arrive at a definite conclusion concerning the proposed guinea subscription. Personally, I regard the suggested plebiscite as the thinnest possible subterfuge, for the result of asking members, "Are you in favour of a guinea subscription?" is foreordained, no matter how elaborately the case is stated. The question for members to decide for themselves is really, "How much do we expect the Union to do?" If members wish their conditions of service to be just and reasonable and the terms of their contracts respected, they must be prepared to provide the sinews of war, should war unfortunately break out. This is the case in a nutshell, and no amount of verbiage can obscure this plainest of issues.

The Guinea Subscription.

NATURE NOTES FOR THE MONTH—JUNE.

BY W. FRANCIS RANKINE.

> "And after her came jolly June, arrayed
> All in greene leaves, as he a Player were."
>
> SPENSER.

THE sunny days and soft-falling showers of spring have resulted in June's leafy glory; Nature enters on her reign of beauty and uninterrupted power. It is the month of fullness, of colour and life, of music and movement, and the countryside is glad in the arrival of the indescribable beauties of summer. The steadily advancing green of springtide has merged into the matured green of complete foliage; the forerunners of floral spring are succeeded by the host of summer blossom; the bird-world is revelling in the joy and freedom that no other month can bring. June is the crown of the year, the harmony of colour and sound.

In the coppice the proud, feathered parents have led their young in short flights through leafy bowers, and soon the bird chorus will be augmented with new performers. Perhaps, in some sequestered hedgeside, a hedge-sparrow is laboriously feeding the cuckoo usurper, while below the nest site her ejected young are lying dead. Here is commercial instinct on the part of the cuckoo and injustice to the hedge-sparrow. *Experientia docet.* Under the eaves are the mud nests of our ever-welcome friends the swallows. With them are the martins and the swifts, and without their graceful, curving flight the summer blue would not be complete. Out in the fields resound the ratchet, whirring notes of the nightjar, the bird of many names. Goatsucker, fern-owl, puckridge, and wheeler are some of the aliases of this reticent bird; yet the name of goatsucker seems a bloodthirsty term for an insectivorous animal.

Then with the gloaming come the bats, and, later,

the hoot of the owl. In the twilight the moths leave their quarters and steal from blossom to blossom. Insect life is at its highest. By day, flies, bees, wasps, and ants carry on their daily tasks, and the butterflies haunt their favourite flowers. And so the procession of appearances continues till the full glory of summer is attained. Flower after flower appears and decorates the verdant earth carpet, insect after insect comes forth and lends its beauty to the summer scene, and bird upon bird sends its peculiar melody into the summer air. It is now difficult to raise a memory of the barren, wintry woods, which are now leafy avenues through which filters the noonday sun; it is difficult to picture the winter difficulties of our songsters, now in their summer glory and wanton carelessness; and it is wonderful that the still chrysalids of the winter months have yielded the active insect life of summer.

Work for the Month.

The wealth of Nature material that abounds during this month makes it difficult for the Nature teacher to select judiciously. However, an endeavour should be made to treat those subjects that lend themselves to correlation rather than those instances that are rare and quite individual in habit.

1. *Leaves.*—These provide an opportunity of studying leaf function, structure, and form. These may be collected, pressed, and stored for the winter months. They also provide the brushwork lesson with useful copies.

2. *Grasses.*—These are now reaching maturity, and their structure and pollination should be noted. The peculiar floral structure of the grasses in general (of which the grains are also members) provides an interesting topical lesson for the seniors, and actual observations, where possible, should be made of their functions. Typical grasses of the neighbourhood should be collected just before they ripen, pressed, and mounted on cardboards. The floral structure should be dissected and mounted beside the grass specimens.

3. *Flowers.*—There are numerous blossoms ready for the Nature Lesson, and these should be treated, as far as possible, in families, so that the family characteristics may be emphasised. Of these, probably, the Cruciferæ are the most important, since their members are so widely distributed. Floral structures, pollination devices, and family resemblances will supplement the month's work.

4. *Insect Life.*—The maximum of insect life is reached during this month and the next. June provides the conditions, *par excellence*, of insect life. The most interesting of these is probably among the butterflies and moths, on account of their obviousness. Yet the observant will find much for comment among the lesser insects—as, for instance, the ants and gnats. In fact, the life-history of the latter is the most wonderful of all insect stories. Among the moths the most interesting appearance is that of the Privet Hawk, which with its highly-developed powers of flight and large size makes it a prize for the entomological cabinet. It may be found by day, about the middle of the month, near a privet hedge, perhaps crawling forth from its pupal case; then it is easy to capture it. When it is on the wing it is a difficult matter to take this insect as it hovers over the scented privet blossom in the twilight. The buzz of its vibrating wings may be heard, a glimpse of its rapidly-moving body may be seen, but it is rarely captured.

Far and wide the Meadow Brown butterfly is seen; and since this is such a widely distributed species, its appearance should be entered on the Nature calendar. The Green Hairstreak butterfly—which, by the way, is a local insect, and feeds on beech in its larval state—provides an instance of protective colouring. Underneath the wings the insect sports a bright leaf-green colour; above is a dingy, dark brown. As it flutters from the beech leaves, on which it loves to rest unseen, it gives the appearance of a dark-coloured butterfly. Suddenly it disappears; it has settled and folded its wings. It is somewhere on the green leaves of the hawthorn; find it, if you can.

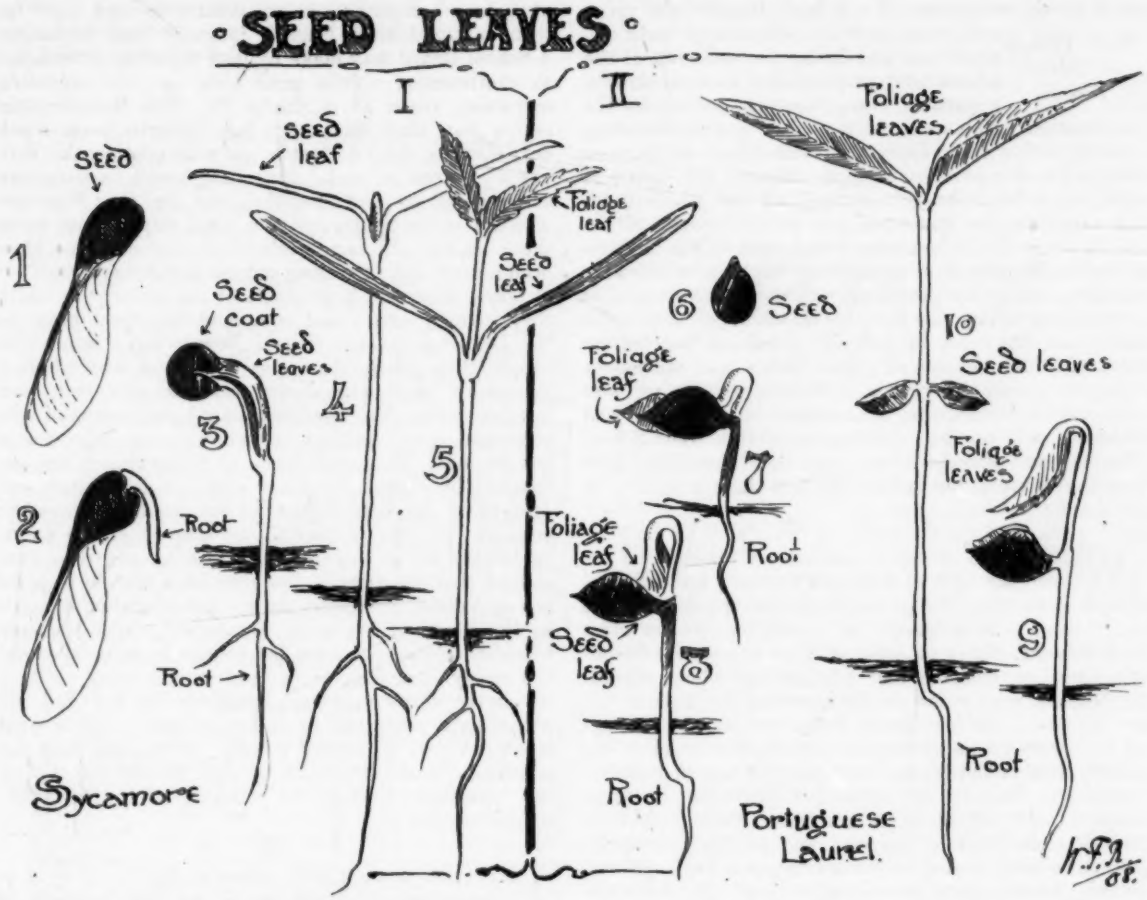
The skippers are a quaint race of butterflies that skip from flower to flower. They are most interesting as affording an apparent link between butterflies and moths. This probable linkage, however, must remain for another paper on account of the detail its importance demands.

Among the moths, the eyed hawk is highly interesting. A year ago, in my expeditions, I came into possession of a female moth, which yielded some fifty eggs. These were sleeved on an apple-tree, so that when the sea-green coloured larvæ emerged they had a plenitude of food in the apple-leaf outer skin. These were successfully reared. Yet it was interesting to note that the ultimate perfect insects were perceptibly smaller than specimens taken under natural conditions.

Material for a Lesson on Seed-Leaves.

At this period of the year the seedlings of spring have established themselves, and in many instances the remarkable function of the seed-leaf (cotyledon) may be observed. There are many familiar type examples which may be used as a basis of such observations, yet none are so remarkable or so distinct as the material obtained from the tree seedlings, such as the sycamore, beech, pine, or laurel. The function of the seed-leaf is to render first aid to the baby plant, and in the majority of cases this operation is conducted beneath the surface of the soil. The tempting conditions that govern germination influence the food storage of the seed, so that sufficient energy is produced to send out the root shoot or radical. Gradually the stem shoot, or plumule, appears, and soon after the plant has become an independent unit in the world of vegetation. The wrinkled and decayed seed-case may be found. Such is the history of the earliest life of the plant in very general terms.

However, in the case of the sycamore this provisional function is evident on the surface. The winged seed, in its autumn flight, has found rest some distance from the parent tree. Perhaps the winter rains have helped it to gain admittance to the soil. Yet in the majority of cases the seeds fall on hard ground and are infrequently buried. Even at this time—namely, early winter—a section of the seed reveals a pair of curled seed-leaves, very tiny, it is true, yet perfect, as the embryos of Nature always are. Spring warmth causes germination, and the root shoot appears. It turns earthwards, establishes itself, and the curling seed-leaves gradually unfold; then the seed-case drops to the ground, and the decaying wings may be found beneath the freed whip-like leaves. These seed-leaves are green, and in this respect unlike the underground seed-leaves. Thus they are able to carry out the function of supporting the plant till the foliage leaves or real leaves appear. When these are formed, there



is no longer any need for the seed-leaf, and having passed its food store into the seedling it falls to the ground. In June the sturdy plants may be found, and the scars left by the seed-leaves determined.

The beech offers another example for continuous observation. Its wide, upturned seed-leaves, silvery white beneath and dark green above, are familiar objects of the beech-wood carpet in spring. The function is, as in the case of the sycamore, provisional, and the seed-leaves soon disappear.

In the Portuguese laurel, very common in this country as an ornamental shrub, the seed-leaves are solid and of triangular section. The gradual development and freeing of the foliage leaves from these is interesting. The seed, which is protected by a case about the size of a cherry-stone, lies on the ground through the winter. In spring the seed-case disappears, and the solid green seed-leaves send out the root shoot, which grows into the ground. The seed-leaves divide, and the already developed foliage leaves rear themselves upwards.

For complete and continuous observation, such as is now undertaken in many schools, the seeds of such trees should be collected in autumn, and stored under such conditions that germination proceeds naturally. The examples taken here should be contrasted with the seed-leaves of the oak, horse-chestnut, and edible chestnut, which do not raise their food stores above the soil. The runner bean gives another instance of a green seed-leaf.

NOTES FROM THE NORTH.

BY ROBERT DICKSON, M.A., F.E.I.S.

NO fewer than five Scottish Education Bills have figured on the legislative programme of successive Parliaments without actually attaining to the full-fledged dignity of Education Acts. It is to be hoped, however, that the Bill which has now got as far as the narrows of the Committee stage may find a safe anchorage in the statute book before the "dog-days." In expressing this hope we are not to be supposed to mean that it meets all our wishes; but it is a step in the right direction, and we are willing to accept it in the meantime as preparing the way for larger reforms in the future. Many educationists in Scotland are strongly of opinion that nothing will be satisfactory that does not provide for extended areas; nevertheless there is a growing feeling that nothing should be done to endanger the passing of the present Bill. This feeling found abundant expression in the debate which took place on its second reading. It is expected, however, that several amendments will be made on its provisions as it passes through the Scottish Grand Committee, to which it has now been referred.

The Education (Scotland) Bill.

* * *

THERE is much in the Bill that commends itself to those who are deeply interested in the progress

of Scottish education. To School Boards are given additional powers. They may incur expenditure, and defray the same out of the school fund, in providing accommodation, apparatus, equipment, and service for the preparation and supply of meals to pupils attending schools within their district, provided that no expense incurred in the purchase of food prepared and served at such meals shall be defrayed out of the school fund. Opportunities for education are to be brought within easier reach of children in outlying parts of the districts of School Boards, or of epileptic or crippled or defective children, either by providing means of conveyance, or paying travelling expenses for teachers or pupils, or defraying the cost of lodging pupils in convenient proximity to the school. Free books and stationery may be provided by School Boards. They are also empowered to provide for medical examination and supervision of pupils. At the present time some School Boards have already taken upon their shoulders these two last powers, but under the Act these will now be legalised.

More Powers to School Boards.

* * *

ATTENDANCE is made compulsory for children between the ages of five and fourteen, and a School Board is to have the power, with the approval of the Department, to prescribe two or more dates in each year as the date of commencing and terminating school attendance for children within its district. A child is to be deemed to attain the age of five years on the prescribed date next succeeding the child's fifth birthday, and to attain the age of fourteen similarly. This is an important provision in some respects. It will allow of enrolment taking place at two or more dates in the year, and especially valuable will it be with regard to the leaving of school. It will enable headmasters to classify their schools more thoroughly. For pupils who change their schools, a certificate is to be issued by the head-teacher of the school to the parents, showing the period during which the children were in attendance at the school, the number of attendances made during that period, and the classes of the school in which the pupils were placed for the purposes of instruction at the time of removal. Power is to be given to School Boards to pronounce attendance orders. At the present time this is the duty of the sheriff. This will tend to remove the decided objection to the present system that it is both cumbrous and dilatory. Compulsory powers should be expeditious and easy.

Enrolment and Leaving.

* * *

EXEMPTION certificates may be granted to children who are not fourteen years of age on condition that they attend at a day school or at a continuation class when such is available, or partly at such school and partly at such continuation class, after the age of fourteen, and until such age, not exceeding seventeen years, as the School Board shall think fit. Clause 9 represents a new departure, and is perhaps best explained by the Memorandum on the Bill issued by the Scotch Education Department. It contains, in the first place, a distinct enactment of the duty of a School Board to make suitable provision of continuation classes for the further instruction of young persons above the age of fourteen years, with reference to the crafts and industries practised in the district (including agriculture, if so practised), and also for their instruction in English language and literature. A School Board may make by-laws requiring attendance at continuation classes until such age, not exceeding seventeen years, as it thinks fit. The Memorandum points out that this duty has hitherto been much neglected by School Boards, notwithstanding the very liberal grants offered, amounting (with satisfactory attendance) to three-fourths, and in the Highland districts seven-eighths, of the total expenditure upon these classes. In fact, while continuation classes have been a great and increasing success in the more populous districts, there are large tracts of the country in which they scarcely exist; and complaint has been made to the Department that School Boards have refused to supply them where there was a demand, and where a reasonably good attendance was assured. But even in towns where continuation classes have been relatively successful large sections of young people who would benefit most from attendance at these classes are not touched by them. In many cases, it is pointed out, everything has been done that can be done by proper organisation and by rousing the interest of the public to further attendance at these classes, and it is considered that the time is now ripe for a certain measure of compulsion. Without the further education directed to the needs of everyday occupation which the continuation classes are intended to supply, it is held that the heavy expenditure incurred in educating children is largely thrown away. Localities by the Bill are accordingly permitted to make by-laws. This is what is objected to by many people. It is said that the provisions should be made by Parliament, and not by the localities. Perhaps an amendment to this effect will be moved.

Compulsory Continuation Classes.

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THE part dealing with pensions for teachers is so important that we quote the two sections *in extenso*. "Sub-section 6 of Section 12 of the Elementary School Teachers (Superannuation) Act, 1898, which restricts the power of a School Board to award and pay retiring allowances to teachers under Section 61 of the Education (Scotland) Act, 1892, shall cease to have effect; and a School Board may also, if they think fit, extend the benefit of the last-mentioned section to any teacher formerly in their employment to whom, but for the operation of the said sub-section, it would have been lawful for them to award and pay a retiring allowance. Where a School Board, or the governing body of any school administered under a scheme approved in terms of the Educational Endowments (Scotland) Act, 1882, or under any provisional order confirmed by Act of Parliament, or the managers of any other school in receipt of grants from the Department, see fit to award and pay a retiring allowance to a teacher, it shall be lawful for the Department to make to such School Board, or governing body, or managers a grant not exceeding one-half of the allowance as awarded, provided that if the said allowance, together with any allowance payable under the Elementary School Teachers (Superannuation) Act, 1898, exceed one-sixtieth of the teacher's salary (reckoned on the average of the three years preceding retirement) for each year of recorded service, or two-thirds of the said salary in all, no grant shall be made in respect of such excess." The weak point in the matter is that it depends on the Board's contribution whether the Government will be called on to give any-

Pensions for Teachers.

thing. It may be therefore necessary in Committee to amend this clause so as to make it obligatory on School Boards to give the half.

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Education (Scotland) Fund.

FOR the more adequate provision of secondary education it is proposed to establish an Education (Scotland) Fund, into which will be paid all the local taxation moneys now applied to education in Scotland. This fund will amount to £350,000, at least, per annum. After meeting certain prior charges in the shape of grants to universities and central institutions, such as technical and agricultural colleges, the remainder will be distributed to the secondary education authorities. These authorities will meet the general charges of a local character, and the balance will be distributed to School Boards and the managers of Voluntary schools. The distribution will be on the basis of population, qualified by the cost of education and assessable rentals in each district. Any School Board which provides secondary education will receive from the Secondary Education Committee payment for the charge upon the rates in respect of children coming from other districts. The School Board which provides secondary education for districts other than its own shall receive half the excess of the cost to the rates of such provision over a certain fixed rate.

* * *

Tenure of Teachers.

WITH regard to tenure, Section 18 provides that if at any time within six weeks after the adoption of a resolution for the dismissal of a teacher in terms of Section 3 of the Public Schools (Scotland) Teachers Act, 1882, a petition shall be presented to the Department by not less than thirty ratepayers, being parents or guardians of children in attendance at the school in which such teacher is employed, or by one-half of the total number of such ratepayers—whichever number is less—praying for an inquiry into the reasons for the dismissal, the Department shall make such inquiry as they see fit. If, as the result of such inquiry, they are of opinion that the dismissal is not reasonably justifiable, they shall communicate such opinion to the School Board with a view to reconsideration of the resolution. In the event of the School Board not departing from the resolution within six months thereafter, the Department may attach to the resolution the condition that the School Board shall pay to the teacher such sum, not exceeding one year's salary, as the Department may determine. Any sum so determined may be recovered by the teacher as a debt from the School Board. It is, however, provided that nothing in the section shall affect the power of a School Board summarily to suspend any teacher from the performance of his duties. While we are glad to have an appeal to the Department, yet we do not think that this clause provides the best means. It will make the teacher the cockshy of opposing parties in a parish. If he incurs the hostility of a certain section of the community for other than professional reasons, he will be liable to dismissal. It deprives him of much liberty of action, and at the same time makes him liable to curry the favour of the parents of the children attending his school. It is surely not the best form of appeal that could be instituted. We wish to see this clause amended.

Memorandum on Nature Study.

THE Scotch Education Department has just issued a very exhaustive Memorandum on Nature Study and the Teaching of Science in Scottish schools. A word of warning is necessary in connection with these Memoranda. Each writer seems to think that his subject is the only one in the school curriculum, and as a result each Memorandum is more elaborate than its predecessor. Teachers who give them their most careful consideration will find in them much that is useful and practical. But after they all are issued, it will require an additional one to show the proportion of time in the school curriculum necessary for each subject. At present there is a great disproportion of matter to the time at the teacher's disposal. Of course it must be taken for granted that there must be co-ordination of work. Nature study must not be kept only for the hour per week on the time-table and rigorously excluded at all other times. The time-table compartment idea requires to be removed, and the correlation of nature study with geography, science, and drawing must be both intimate and practical. Observation must not give way to mere reading. Diagrams, pictures, or other representations must never be allowed to usurp the place of the things themselves. This is the principle laid down by the writer. The formal intrusion of a text-book into the work of a class, or the dependence upon it for information which ought to be gleaned directly from actual observation, is altogether foreign to the spirit of nature study. It is true that the teacher's own observation on any subject should be both complete and accurate, and in order that it may be so personal observation must be confirmed and supplemented by consultation of whatever authorities are available. In rural districts it will be comparatively easy to carry out the spirit of the Memorandum, but in cities there will be some difficulties. It seems to me that our museums could be more utilised in this connection. It might be possible to arrange in some of the rooms such things as will be of value in such work. To take an example of what I mean—the life of a bird might be taken, its nest and eggs shown, and the different kinds of food it eats.

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Seasonal Nature Study.

TO the Memorandum are added some suggestions for seasonal nature study in schools by Professor J. Arthur Thomson, Aberdeen. He points out that this method has many advantages. It is natural—that is to say, it is always relevant to what the pupils are seeing and feeling at the time. It is easier, too, by this method to get fresh or living material for study. By following the course of the seasons, the school nature studies will keep in touch with the human activities going on around—for example, on the farm and in the garden and on the shore. In this way the reality of school-work will be increased. This method also makes it easier to avoid the common mistake of supposing that nature study for children means a series of elementary lessons in botany, zoology, geology, mineralogy, and so on. The time for this parcelling out into subjects or special sciences is later. The child should have a scientific way of looking at things developed long before it hears anything about special sciences. He then gives a series of spring, summer, autumn, and winter studies. We are inclined to question if the illustrations he gives bear out the principle

laid down in the Memorandum—namely, that from the beginning the pupil should rely on his own observation for his facts. He says the eggs of the salmon are laid in the winter months in the sandy and gravelly bed of the stream by the female salmon, and fertilised there by the male salmon. How many children have seen this, we would like to know. How many teachers have seen it? In fact, the difficulties that surround this are so great that we venture to think that very little of it will be possible even in rural schools. The second illustration is not much happier—the reappearance of the humble bees. While, therefore, we desire to see nature study made more observational, we question if the illustrations here given will lead to the cultivation of that mood. There is, however, much of great value in the suggestions, but there is just a feeling that the study is a little too deep for the children of our primary schools. The difficulty is the getting of the happy mean, and teachers need not be disheartened if they find they cannot go so deeply into the question as is suggested by Professor Thomson.

HOLIDAY COURSES ON THE CONTINENT.

BY W. T. THOMPSON, B.A.

WITH the advent of summer the thoughts of many of our readers will be turning towards the approaching long vacation and the way in which it is to be spent. As he who would command must first learn to obey, so must the genuine teacher ever remain a learner, and to many the summer vacation is a call to come down from the rostrum and take one's place again at the feet of others. That a course of vacation study, pursued amidst the novelty of foreign surroundings, and with the attraction of mingling with men and women from various lands, can be a restful and enjoyable way of spending a summer holiday has been often testified to in the pages of this journal. The summer vacation offers to those who, for their own pleasure, are studying a foreign language the opportunity of extending their knowledge under the most competent guidance, and at the same time of getting an insight into life abroad which is denied to the ordinary traveller. To many a teacher whose daily work includes the teaching of some modern language the vacation course has become almost a necessity, enabling him to deepen and extend his knowledge, and to become acquainted with the newest ideas on language teaching. Next in importance to the courses in languages are those in pedagogy, for which Jena has for years been famous. Outside Germany and Austria the centres for holiday courses only offer instruction in the language, literature, history, and art of the country. Salzburg offers in addition philosophy, law, and natural science; Marburg has courses in pedagogy, English, French, and Italian; Greifswald, in hygiene, natural science, and psychology; Neuwied, in the social and economic aspects of Germany; and Jena has a very full programme of some fifty-one courses in philosophy, natural science, law, theology, language, and pedagogy.

The number and importance of these vacation courses has, year by year, been extending, and the best university teachers, some of them men of European fame, give their services to them. Some universities, particularly that of Grenoble, organise summer courses extending for four months, the vacation courses running parallel with or forming parts of the whole summer course. The summer course at Grenoble is held in all the faculties of the university, and participation in it counts towards the terms to be kept for degrees both there and by arrangement at some other universities. Of course English students are not the only ones catered for at the various vacation courses held abroad, and it is this mingling of men and women of different countries which constitutes one of the greatest charms of participation in one of them. This applies to all except the courses arranged by the Teachers' Guild, which are for English-speaking teachers only. The holiday courses at Jena are short in duration, lasting altogether only for three weeks, but are most varied in character. Fifty-one courses in all are held, and it is a further peculiarity of the Jena programme that it appeals very largely to Germans, embracing as it does courses in English, French, and the system of taxation, land reform, colonial policy, and other questions of immediate interest in Germany.

The yearly growth in the number of foreign universities and institutions providing vacation courses is the best proof of their popularity and usefulness. In the majority of cases it is the authorities themselves of the universities who arrange the courses, but others are arranged for by bodies such as the Teachers' Guild, the Regent Street Polytechnic, the Alliance Française, and the International Guild. In all cases there is a local committee, which fixes the fees, provides accommodation at most moderate rates for intending participants, and endeavours to make their stay as agreeable as possible by arranging lectures on artistic and literary subjects, and excursions to points of interest in the neighbourhood. The committee responsible for the direction of the course at Versailles includes representatives from England and Germany, whilst that of Jena bears a strongly international character, practically every country in Europe being represented on it. The tuition fees are in every case very reasonable, and are in general fixed at a rate which will bring them within the means of teachers who cannot afford to spend much on their holidays. At Dijon students who have followed the course regularly and with industry can, if they so desire it, obtain a certificate to that effect; and at several other of the French centres they may present themselves to be examined for a certificate testifying to their ability to read and write French.

In addition to other advantages offered to intending students, reductions in railway fares can in some cases be obtained. For instance, English students who are taking part in the Grenoble course can obtain return tickets from Paris to Grenoble at half rates; and those attending the courses at Honfleur, Bayeux, Granville, Caen, Lisieux, and Villerville-sur-Mer can obtain special cheap tickets from Southampton on presentation of their entrance ticket to the holiday courses.

Any of our readers who intend to spend their holidays abroad in the profitable way we have been describing may obtain, on application to the Director of Special Inquiries and Reports, Board of Education Library, St. Stephen's House, Cannon Row, Whitehall, S.W., a full list of the courses, which contains information as to railway fares, cost of board and lodging, details of the courses and names of those who can give further information. Many places have prepared an interesting booklet, which the secretary, whose name appears in the Board of Education list, will send in response to applications.

Our Art Section.

SOME WELL-KNOWN BRITISH MEZZOTINTERS.

V.—VALENTINE GREEN.

BY W. E. SPARKES.

VALENTINE GREEN—A FINE ENGRAVER OF MASTERLY PORTRAITS.

AN engraver reveals himself in his craftsmanship quite as surely as the writer or the artist. A dashing Prince Rupert wields the mezzotint-scraper like a sword, sweeping it across the plate with energy and decision; a patient and methodical artist, such as Richard Earlom, picks out the tiniest points of light, feeling his way along the finest lines with the utmost care. And if an engraver is left free to choose his own subjects, he will naturally select those that agree with his particular way of looking at nature. If he loves strong contrasts, he will rather engrave Rembrandt than Gainsborough, because there are wider differences among the lights and shades; a less emphatic man finding more delight in open-air effects, where the sunlight finds its way into every shadow.

"INIGO JONES." (PAINTED BY SIR ANTHONY VAN DYCK.)
(Photo by H. Koester.)

Valentine Green stands self-confessed in his work as a sensitive artist with the most delicate sense of refined light; methodical and painstaking to a degree—to such a degree, in fact, that a trifle more dash and abandon would often have added strength, life, and vigour to his engravings. It goes almost without saying that such an engraver would find himself in perfect sympathy with the simple and charming portraits for which the eighteenth century in England is renowned—portraits of well-bred people posed in unaffected grace—the portraits of Sir Joshua Reynolds, Gainsborough, Romney, and Raeburn. And if he cast back in time, he would be attracted by the charming circle of such dainty court painters as Sir Peter Lely or Sir Anthony van Dyck, who, though living in richer and more ornamental surroundings in the heart of a royal court where display was the vogue and luxury a by-word, were yet by nature courtly, graceful, and refined.

One authority on mezzotint would account for Valentine Green's grace from the fact that his father was a dancing-master! That is a somewhat dangerous theory to press too far. Professors of deportment do not figure largely among the parents of sensitive artists. One might as well trace Turner's skill with the brush from his father's sweeping and free-armed circles drawn round and about the faces of his clients in the little Chelsea barber's shop overlooking the Thames; and even then it would be a pretty problem to account for the hereditary influence of millers, sailors, carpenters, innkeepers, and other similar prosaic tradesmen whose sons have occasionally become famous painters.

Such things are beyond the reach of certitude, and cannot be accounted for by scientific law. Nature seems to try her 'prentice hand on all classes; she hits off her masterpieces with careless ease and almost by accident; and nowhere does this appear more evident than in the arts. Even environment seems to count for very little: Valentine Green at the dancing academy owed none of his delicacy and grace to proficiency in the minuet and waltz. Indeed, he turned in the most matter-of-fact way in the world to scenes as far removed as possible from the parental academy of deportment. Entering the office of Mr. Phillips, the town-clerk of Evesham, for two years he wrestled with figures and dry, official returns, apparently with much success, although his heart was not in the work. At least, one must think so, for he is found after two years entering himself as an apprentice—although past his majority—to a Robert Hancock, potter and line-engraver. This was admirable practice for his future work; and perhaps the orderly balancing of books may have trained him in that patient and quiet methodical handling for which he is famous in mezzotint.

In those days—Valentine Green was born in 1739, and became a mezzotinter in 1765—most engravers tried their hand at the fashionable method that had taken the town by storm, so that it is quite likely Green learnt the rudiments in Hancock's workshop; for, coming to London in 1764, his name appears two years later as an exhibitor in mezzotint at the exhibition of the Incorporated Society of Artists. In 1767 he engraved his first picture after Sir Joshua Reynolds.

There are names closely associated in art—the painter Sir Thomas Lawrence and the engraver Samuel Cousins, Constable and David Lucas, Reynolds and Valentine Green. It is true all the great mezzotinters found it to their interest to engrave Sir Joshua's popular portraits, and they succeeded, with a difference; but it is generally acknowledged that Valentine Green, at his best, was supremely successful in translating the refinement, simplicity, and charm with which Sir Joshua's portraits of fashionable women are instinct.

Valentine Green rose rapidly in his profession, mainly from his skill in translating the court painters, Reynolds and Gainsborough. He was at last, in 1773, appointed official mezzotinter to George the Third. He was everywhere in demand, and his skill increased. Perhaps the best known and the most eagerly sought for of all his prints are those he published in 1780. The advertisement stated that he proposed to publish six plates from the "original pictures of Sir Joshua Reynolds, forming a series of *Beauties* of the present age. Two portraits will be published together. Price to subscribers, 12s. each; to non-subscribers, 15s. each."

The series was afterwards extended to nine plates. They sometimes appear to-day in the great salerooms, and invariably cause a flutter; competition is keen enough to inflate the prices to a degree that would have made Valentine Green rub his eyes with astonishment. A few years ago one of this series ("The Duchess of Rutland"), published at 12s., was sold for 1,000 guineas! And yet poor Valentine Green died in abject poverty. He had received permission from the Elector Palatine to copy in mezzotint some masterpieces at his Dusseldorf palace, and he engaged artists to assist him in what he hoped would prove a profitable speculation. But, unfortunately, in the midst of the work Napoleon began to knock at the gates of many European cities, and with such energy at Dusseldorf that his cannon smashed the palace into hopeless ruin, and with it the poor artist's most rosy prospects. The expenses he had incurred were too heavy for him to meet; his old age was spent in penury.

"Inigo Jones, Architect." (By Sir Anthony van Dyck.)

Valentine Green engraved nearly four hundred plates, covering a wide area, and including works after the old masters Rubens, Jordaens, Raphael, and Van Dyck. One understands his sympathy with Van Dyck, the fashionable painter at Charles the First's court, an artist distinguished for his quiet dignity, even from the early days, when, as a precocious boy of fourteen, he had painted portraits in Antwerp. Here he worked as an assistant to that generous, extravagant prince of artists, Rubens, who valued Van Dyck for his precise draughtsmanship. Afterwards the young artist's portraits of sedate, calm, well-bred people, with their wonderful modelling in the faces and delightfully drawn hands, their air of nobility and reserve, won him fame at a very early age. Poets added their praise to that of his satisfied clients. "Rare artisan!" exclaims Edmund Waller,—

> "Rare artisan! whose pencil moves
> Not our delights alone, but loves;
> From thy Shop of Beauty we
> Slaves return that entered free."

He was most at home in princely courts. The story runs that when he visited Rome, his countrymen there, distinguished for their drinking and roistering, welcomed him with open arms, but were met with a contemptuous stare from the handsomely dressed Fleming with velvet cloak and a feather in his hat. "A popinjay!" they called him, "who couldn't paint."

This portrait of Inigo Jones is typical of his portraits. The well-bred, intelligent face, set off with its trim-kept beard and carefully-groomed mass of dark hair, is admirably drawn and full of character; while the appropriate velvet coat and lace collar form a fit harmony. Van Dyck made much of dress; he loved silks, satins, and velvets draped in rich curves; but though his noble sitters were thus handsomely dressed, they wore their raiment handsomely, and not as lay figures for the display of costly material.

Like Van Dyck himself, Inigo Jones was quite at home at court. He had travelled in Italy, whence he returned to plan buildings after the Italian style, the most notable being, perhaps, the beautiful banqueting-hall, Whitehall, which still exists. He was a painter, too, and used his art to amuse the court of Charles the First. Robert Blatchford * humorously remarks: "There is something quaint in the record that, in 1633, when a masque of Ben Jonson's was played before Charles the First and his queen, the scenery was painted and arranged by Inigo Jones, and the dresses and properties were attended to by Lord Bacon and John Selden. What lines for a pantomime bill!

The Gorgeous and Beautiful
MASQUE
By Ben Jonson.
The Sumptuous and Picturesque
SCENERY
By Inigo Jones.
The Chaste and Elegant
COSTUMES
From the original designs of Lord Bacon.
Property Master:
John Selden.

What would Crummles do with a bill like that?"

Valentine Green was particularly happy in translating such a portrait. Van Dyck's care for particulars, his style smooth rather than strong and forcible, his exquisite drawing and his regard for textures, fitted exactly with Valentine Green's humour. No wonder his mezzotint reflects his delight in copying such a painting.

"David Garrick." (By T. Gainsborough, R.A.)

It seems a far cry from Van Dyck to Gainsborough, yet there is much in common between the two men. If there is one quality more than another that marks out Gainsborough as a portrait painter it is his elegance, if one dare use the word nowadays. He could paint

* In *My Favourite Books*.

"David Garrick." (Painted by T. Gainsborough, R.A.)
(Photo by H. Koester.)

anything—portraits, still-life, and landscape—and all with that delicate charm that can be appreciated but hardly explained. There is nothing strenuous, nothing forced; it is very seldom he expresses action; his people are eminently at their ease, and seldom posing for effect; indeed, they are sometimes purposely straight and unbending. Yet, even when he paints children in rags, they have still the appearance of young nobles playing a part in fun; the trees among which they wander are eminently shapely, the aristocrats of the woods.

Sir Joshua Reynolds had painted Garrick the actor, and Valentine Green had made his first success in a mezzotint from this painting. It is not surprising to find him engaged again in engraving a portrait of the versatile actor, who fills so large a space in the story of those days.

David Garrick was a born actor. He distinguished himself in mimicking the elephantine movements and uncouth gestures of his first schoolmaster, Dr. Samuel Johnson, though the friendship between master and pupil afterwards ripened into a strong attachment. The school not proving a commercial success—it never had more than three pupils—Dr. Johnson determined to leave Lichfield for London, and had for companion his volatile young friend. "I came to London with twopence halfpenny," said the Doctor to Garrick; "and you, David, with exactly three halfpence in your pocket."

At first he studied law, but his natural bent was toward the stage. Shakespeare was just then coming into his own after a period when the finical and the bombastic modern plays, fashionable in the eighteenth century, had ousted all the Elizabethans from polite society.

Garrick made a bold venture when, in 1741, he played the part of Richard the Third on the London stage. There was an instant success; Shakespeare became the rage; the pasteboard heroes were driven from public to recite their even-balanced but bloodless lines in private, while a new spirit called the public to see and marvel at the greatest English dramas of all time.

Small wonder that Garrick worshipped Shakespeare. Everywhere the public crowded to see him as Hamlet, Lear, or Richard; at Dublin the playhouse was so crowded that the wits said "a very mortal fever was produced which was called Garrick's fever." This was in 1741. Public interest had been so roused and maintained that, in 1769, Garrick was able to effect a very memorable jubilee at Stratford-on-Avon in commemoration of his hero. In remembrance of this, Garrick, the life and soul of the movement, was persuaded to have his portrait painted for presentation to the corporation of Stratford-on-Avon; and who more fit to do this than his friend, the fashionable painter, Gainsborough? The outcome was the painting from which Valentine Green made this fine mezzotint.

It is very unlike Gainsborough's usual style in one particular—the pose is so theatrical; but tradition has handed down the saying that, while Garrick was the most natural man in the world on the stage, he was the most theatrical and inveterate *poseur* in private life, so that it is quite likely he insisted on having his portrait painted in this most unusual manner, embracing a bust.

One would say here was a vain man indeed. But so he was, and Gainsborough, like all great portrait painters, makes us read the character in the face and the pose. A gentleman complained to Dr. Johnson of Garrick's vanity. "No wonder, sir," said the sage, "that he is vain—a man who is perpetually flattered in every mode that can be conceived. So many bellows have blown the fire, that one wonders he has not by this time become a cinder."

Garrick's gaiety and whimsicality have become a proverb. Few pages in Boswell's *Life* are more delightful than the little masterpieces he gives of Dr. Johnson and Garrick in company. There is that scene where the actor catches the Doctor by the lapels of his coat, looks up into his face, and gives his wit and humour full play, while the burly Johnson looks down on him with a smile, and quietly shakes his head at him from side to side, as a grave elder might reprove an irresponsible child. "Davy," says he at another time, "has some convivial pleasantry about him, but 'tis a futile fellow." And then again, "Garrick's conversation is gay and grotesque. It is a dish of all sorts, but all good things. There is no solid meat in it; there is a want of sentiment in it." Though he also added, "Garrick's gaiety of conversation has delicacy and elegance."

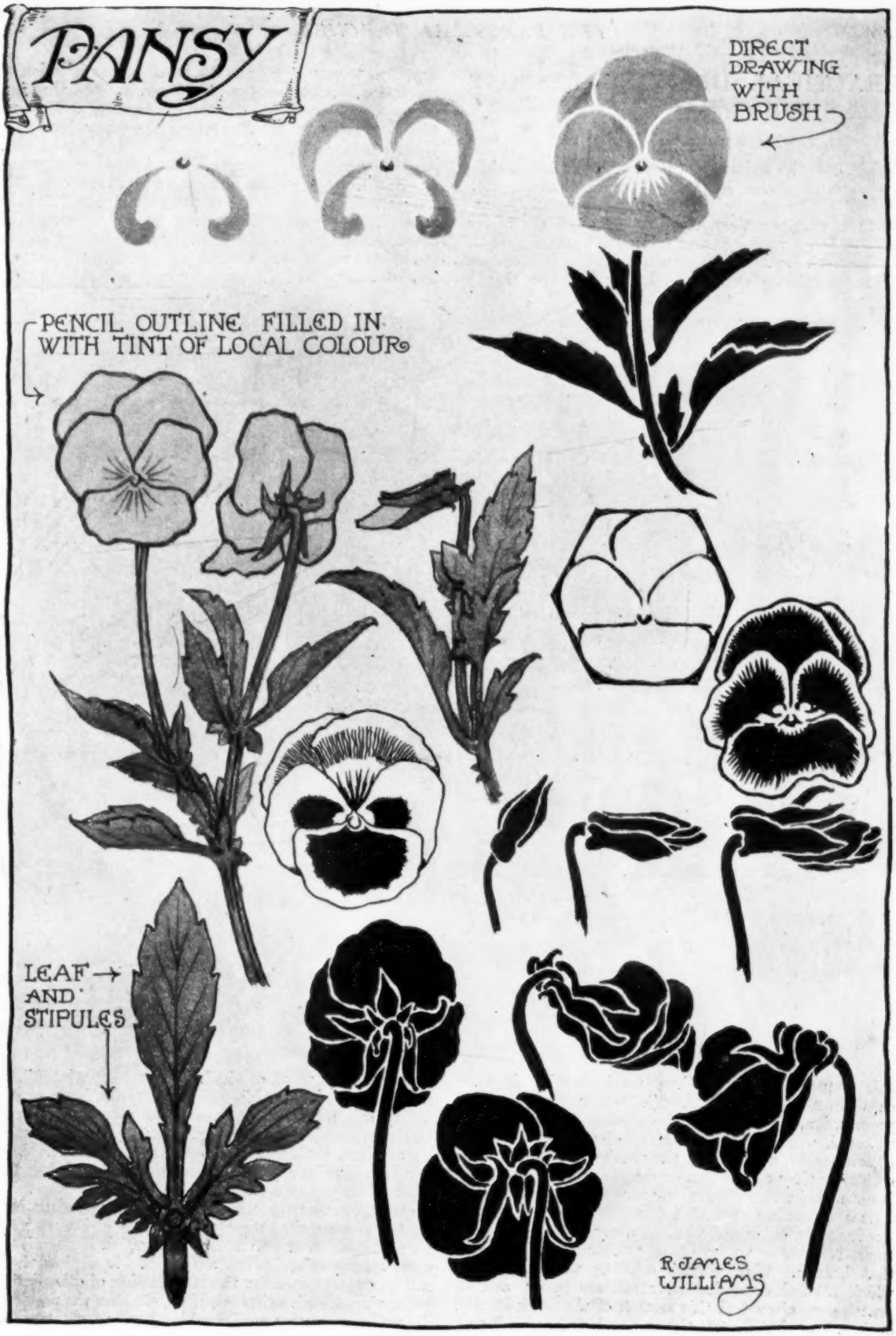
In such sentences the inimitable Boswell has painted a dainty word-picture of the great actor, the man who was equally great in comedy and tragedy. *So* he walked the world, and *thus* he was summed up by a sage.

Gainsborough fills in the outline sketched by the Doctor. He paints Garrick as a gentleman, but a whimsical gentleman, with all the marks of humour and quaintness in his pose and quizzical smile. The painting makes us realise instantly the great actor as he moved in his circle, throwing his sparkling wit on all sides, upsetting the gravity of divines, and playing a thousand verbal tricks with eminent lexicographers. The clean-cut features, the quiet smile, the mobile lips, and the keen eyes are eloquent of the man. His easy grace bespeaks the finished actor.

Gainsborough, as always, makes use of the simplest composition. The easy swing of the body is kept from becoming too weak and invertebrate by the uncompromising walking-stick, while the action is carried on by means of the tree trunk behind the bust. That pedestal would be a most ungainly feature, and would be much too insistent, if the artist had not softened its outline by foliage from the tree behind and by growths from the ground. If you try to trace its sharp edges, you will find that one line is hidden behind the actor's arm and hat as well as by thick foliage; another edge is crossed and broken by a curved bush, which also partly hides the third edge; and, to complete the softening, thick grass grows at the base, and sends up a plant that breaks the space between the actor's legs and the pedestal. And not only so, but the foliage is made to hang over the head of Shakespeare as a wreath, so that the tree plays a large part in the composition.

There is just a suggestion in the background of that tender landscape for which Gainsborough is so famous. The building is said to represent a favourite summer house in Garrick's garden, for he lived in style. It is not often that an actor leaves a fortune of £140,000, as Garrick did!

Here, then, were three artists much in sympathy—Van Dyck, Gainsborough, and Valentine Green. The painters were remarkable for their elegance, refinement, and grace; the engraver is among the most delicate translator of dignified and sober portraits in the history of mezzotint.



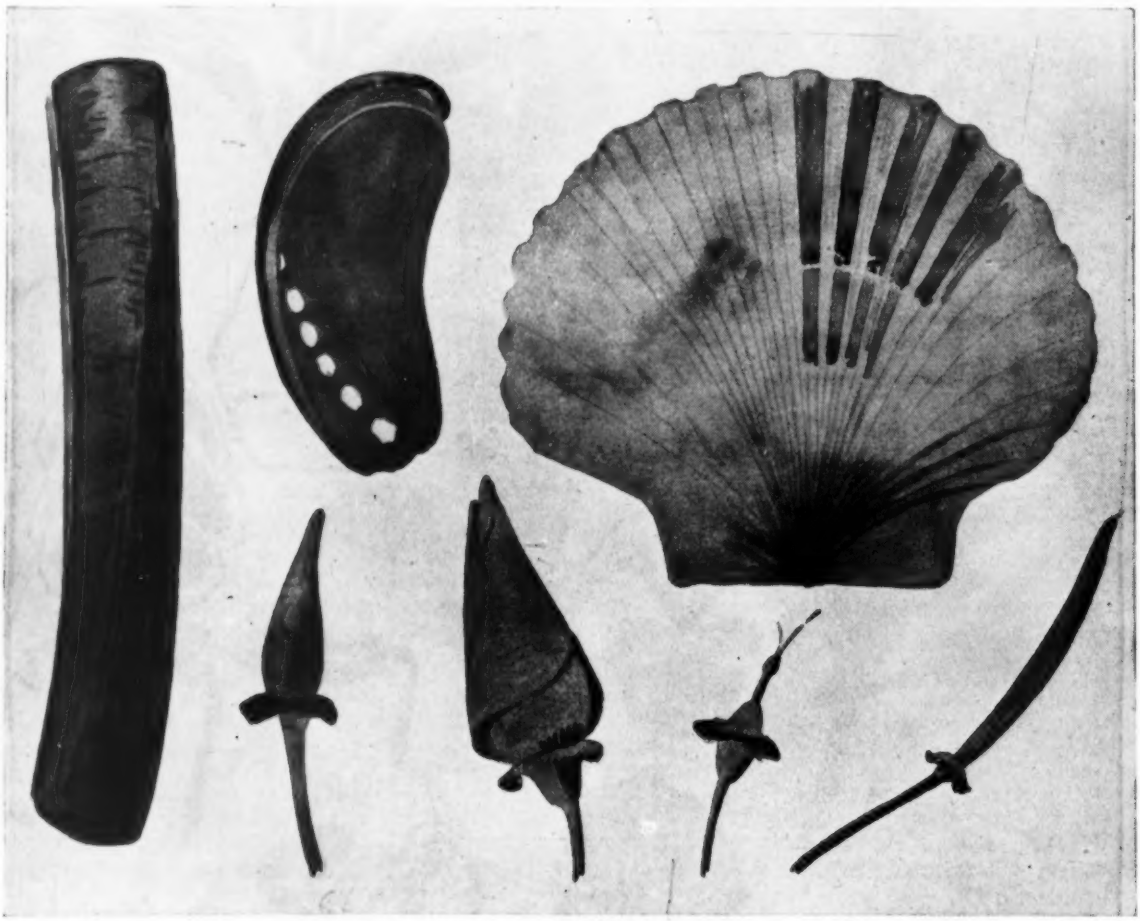
DRAWING FROM NATURE.

PRACTICAL DRAWING LESSONS.

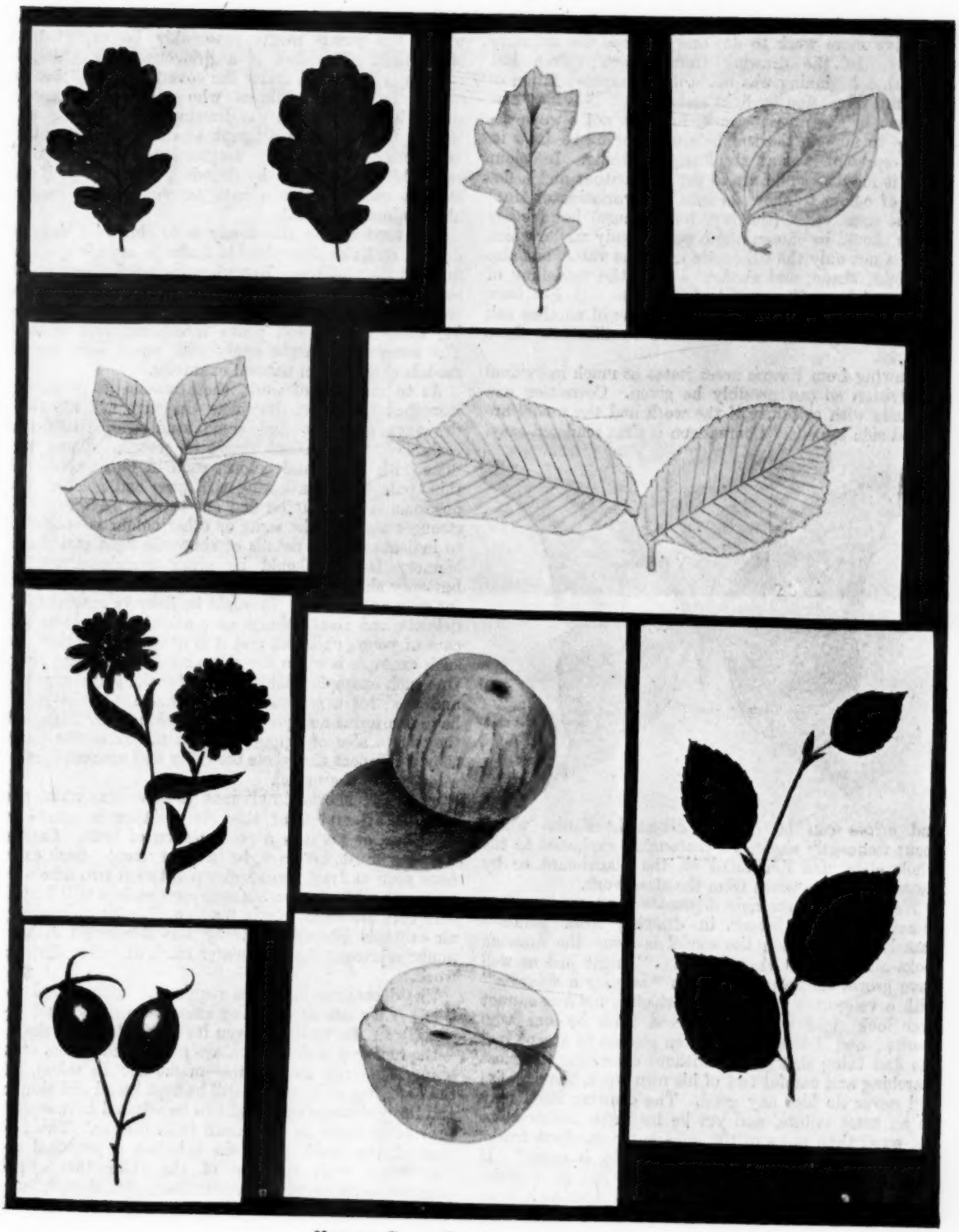
CLASS III.

Drawing from Nature.

UNDER the guidance of a capable teacher nothing comes amiss for the lesson in drawing from Nature. The supply of material is abundant, and teachers who put thought into their work are always able to select sufficient and appropriate matter for the lesson from familiar things which arouse interest and stimulate effort. Experience, however, proves that in this connection as in others teachers who do take care are not too plentiful. The few extra minutes of preparation, the trouble of collecting and arranging material, and the proper grading of the work become irksome tasks, and because they make a raid upon one's own time they are seldom or never done. Yet if there is not sufficient interest in any part of one's lifework to induce a person to spend a few spare hours in setting the house in order and to clear away possible obstructions, it is futile to expect any measure of success in that branch. With Nature drawing the errors into which a careless teacher may fall are many, and in practice we often find this section of the work carried on in a way that defeats the end and aim which it was supposed to serve. On the one hand, a poor selection of specimens is made—in the case of plants, etc., they are often mutilated (if not beyond recognition, at least to such an extent that all grace and beauty have left them)—or the other extreme is reached when we find carrot leaves, chrysanthemums, and ferns handed out to children as exercises in drawing and modelling. We have then reached a state of things which is infinitely more hopeless than that which prevailed when the South Kensington copies formed the necessary stock-in-trade of the teacher of drawing. It is of the utmost importance to lead the pupil by easy stages from that which is easy to that which is more difficult. There must be continued striving after perfection in executive ability and a steady increase in the power to observe and express with precision and truth. This is not to be attained without much application, and the best results are to be looked for in the class which has the work given out in a carefully considered sequence. It is quite possible to do this at all stages of the work, and for the present class a very good series of lessons may be arranged from leaves and sprays, shells, feathers, eggs, seed-vessels, flowers, and fruit. Doubtless there will be opportunities for the introduction of other interesting things, such as insects, birds, etc., but the previous list will give a very good working basis to go on with.



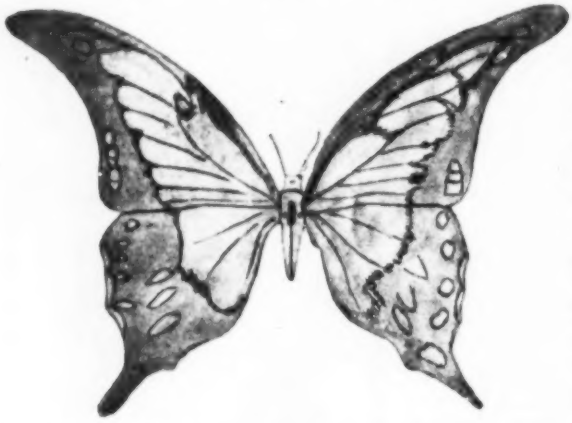
Natural Forms—with Simple Washes of Colour.



NATURAL FORMS SUITABLE FOR CLASS III.

As in Class II., entire leaves with serrated margins will be quite difficult enough, but this might very well be varied by using sprays of three or more leaves. This will give more work to do, and increase the difficulty slightly. In the drawing from objects (given last month), a beginning was made in the representation of the third dimension by light and shade. This may also be done in the present work, for it is not always desirable to mangle the leaf before beginning to draw it, or to represent it as an absolutely flat thing. In colour work it may be sufficient to get the contour and a flat wash of colour to show its tone and variation of tint; but in some cases (the ivy, for instance) large bossy leaves should be chosen and a pencil study made, which renders not only the silhouette and tone value, but also the light, shade, and shadow due to the modelling of their surfaces. The oak leaf on page 641 has been treated in this manner (a brush drawing of another oak leaf is also given), and will serve to illustrate these remarks.

Drawing from Nature necessitates as much individual supervision as can possibly be given. Correction can be made with certainty if the work and the model are placed side by side. Comparison is thus rendered easy,



and errors can be quickly detected. Faults which occur frequently should be thoroughly explained to the whole class, and illustrated on the blackboard or by chosen examples taken from the class work.

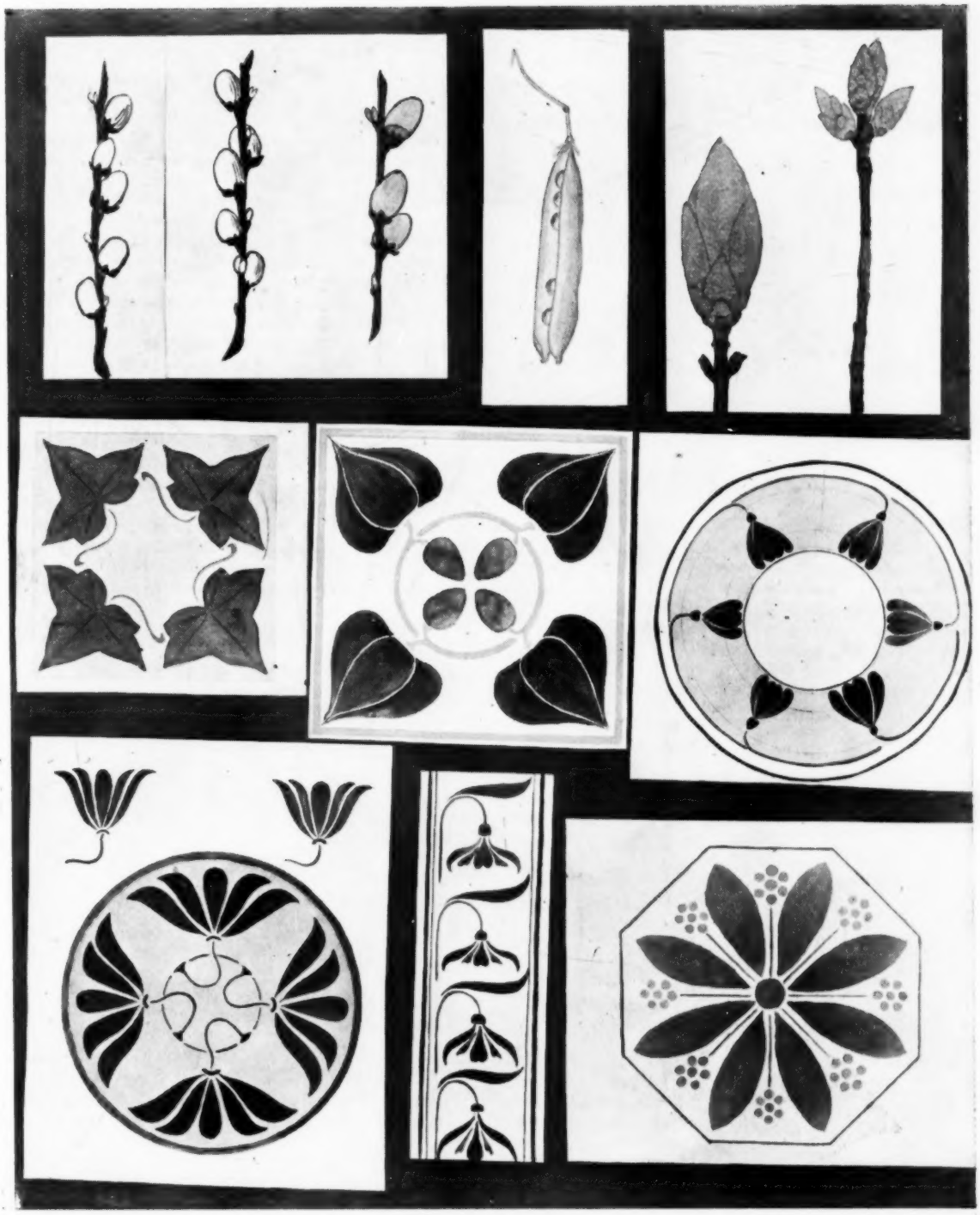
We cannot too strongly deprecate the loose idea that sometimes gains favour in drawing from plants—namely, that "when the model is away the drawing looks all right," or that the plant "might just as well have grown this way." This is "*hugging a delusion*" with a vengeance. A drawing which is *not true* cannot ever look right or be considered good by one who knows; and if a student is to be pleased to accept just the first thing that comes, without exercising the most searching and careful test of his own work, the exercise will never do him any good. The drawing itself may be an utter failure, and yet be far more beneficial to the pupil than miles of the apparently excellent freaks which look so pretty "*when the model is away.*" If the task set is a spray of leaves, it is just as essential to have the spaces between the leaves right as it is to have correct drawing in the leaves themselves. The angles of growth and the characteristic junction of stems must be conscientiously studied. Buds and venation must be rendered with an honest endeavour to be truthful; or, if too microscopical or complicated, they should be frankly left out. Better leave such a study for a future occasion, and try a simpler thing which the pupils might reasonably be expected to accomplish. This last is a grievous error which is frequently condoned under the covering word "*correlation.*" To expect children who cannot represent a simple leaf properly in the drawing lesson to gain any benefit from a futile attempt to draw a whole plant and sections is a mistake. Impressions of Nature would certainly be reinforced by drawing, but only so if the children can draw them with anything like a reasonable approach to truth.

The tendency in this study is to slur over difficult details, and this discreditable desire is not always confined to the children. But wherever teacher and pupils set themselves a certain task, and, with all reverence for truth, honestly endeavour to render it as well as can be, these lessons will prove interesting and fruitful. The foregoing remarks apply with equal force for all models chosen from natural examples.

As to methods of work, these remain as previously described for object drawing. On page 640 are three drawings of shells and some studies of the flower eschscholtzia at various stages of growth. These were done with brush and colour, each in two washes. A thin, pale wash, indicating the mass and general proportions, is first put on and left to dry. Afterwards a stronger wash of the same or other colour is employed to indicate smaller details or show the light and shade. Memory lessons should be given occasionally. The butterfly shown at the end might form a good example for such an exercise. It would be risky to entrust such delicate and costly things as stuffed specimens to the care of young children, and it is quite evident that one such example is of no use as a model for drawing from. One such example might be kept for the brighter pupils and used for a general memory lesson. If the pupils have the forms and proportions explained to them, and they have also an opportunity to memorise the same, they will repeat the whole tolerably well without further reference to the model.

Page 641 shows simple natural specimens which can well be attempted at this stage either in pencil or in colour, or perhaps a combination of both. Careful drawing must, however, be insisted upon. Such exercises need at least one specimen between two scholars; where possible, a separate specimen each is still better. The very cleverest pupils may possibly be able to try an example like the butterfly, but this would without doubt represent the high-water mark of junior division work.

The decorative examples require no further explanation. They are space-filling exercises merely, and are exactly similar to those given for Class II. New shapes—the hexagon and octagon are given, and others combining the circle and square—might now be taken, but the repeating units should still be kept broad and simple, and for preference they ought to be selected from studies previously made by the pupils from Nature. This section of the work gives the scholars a practical acquaintance with the use of the ruler too. Such practice is by no means unnecessary, for though ruler drawing may not be "art," yet the power to construct simple geometrical figures with accuracy and precision is often a valuable asset in the pupils' training after they have left school.



SIMPLE SPACE-FILLING.

SIMPLE DIRECT BRUSH STUDIES FROM NATURE.

TEACHERS' CERTIFICATE DRAWING COURSE.

MEMORY DRAWING OF OBJECTS.—I.

BY A. F. RICHARDS, SECONDARY SCHOOL AND PUPIL-TEACHER CENTRE, JARROW-ON-TYNE.

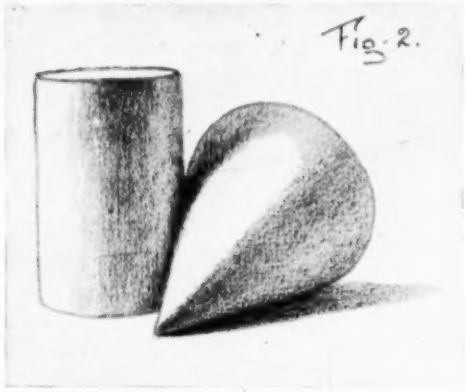
THESE articles are intended primarily to help teachers sitting for the Certificate Examination. At the recent examination candidates must have received something of a shock on finding themselves face to face with the questions of the Drawing (theory) paper. They were ideal questions certainly, but for all that very unreasonable on many grounds. As they have been already dealt with by the editor, we do not intend to discuss them now. We will devote our attention in this article to the subject of memory drawing—one of the most useful and practical of drawing requirements apart from any consideration of the syllabus. Whether looked at from the standpoint of the specialist or from that of the elementary teacher, it has everything to commend it.

Forms simply copied pass soon from the mind if not impressed by recourse to memory drawing. It must be borne in mind, too, that a knowledge of drawing is important to the primary teacher, not altogether for the use that can be made of such knowledge in the school drawing lessons, but incidentally in other lessons, as geography, history, etc., in which spontaneous drawing and sketching are often in demand, and as often but inadequately supplied. The teacher's drawing equipment should therefore help him to satisfy this demand, and not be looked upon solely as a means by

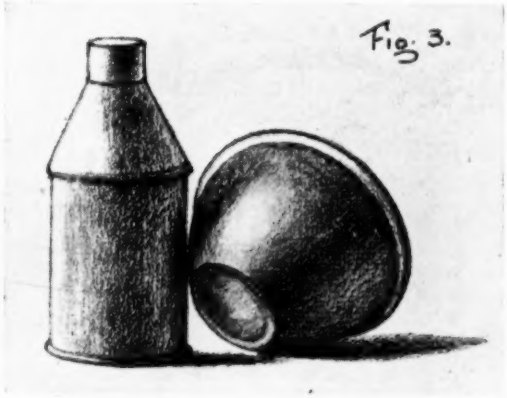
which he will be enabled to make elaborate drawings, although on occasions these are necessary. Drawings of this nature are often copied (for necessity compels it) from special drawings dealing with the subject-matter of the lesson. This class of drawing is, however, not of the order to which we now wish to draw attention. It is to object drawing, and the use of the intelligence and imagination in connection with it, that we invite consideration. Progress in this direction will help to meet what is often expressed as "a long-felt want."

Now, the first point we wish to emphasise is that memory drawing, generally speaking, is not *altogether* a question of memory. It is one in which imagination and reason are largely concerned. Some teachers may be often heard to say that they "have no eye" for drawing. We desire to show such as these that they will find some satisfaction on discovering they have "a head" for it, at least in this particular branch—namely, memory drawing from objects.

It is hardly necessary to state that there must be



the preliminary exercises of copying, drawing, storing, and noting. To do this, a drawing notebook should be in the possession of every teacher in training. It should be a part of his stock-in-trade. If he has an aptitude for drawing, he probably *will* have one. But we write here, not so much for the one who has an aptitude, as for the greater number who have but ordinary ability. A small sketch-book does not demand much pocket room, is available at a moment's



notice, and can be used at odd times and in odd places. It has everything to recommend it. It meets the objection of the student, if he wishes to make it, that there is no room for object drawing at home.

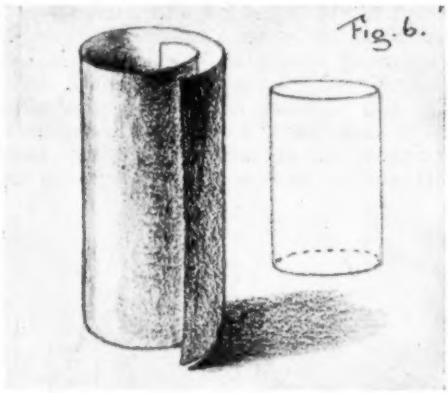
The *principles* underlying object drawing can be very well learnt and expressed by a small drawing, and the linking together of these cardinal principles is, as far as our experience has shown us, the one particular weakness which the average teacher has to strengthen. In his home he has a wide field in a narrow compass. There he can get off the beaten track of examination

regulations. He is not hampered by "an imperial drawing board eighteen inches from the floor," or by being advised to sit "about ten or twelve feet from the object." On the walls, on shelves, in cupboards, on sideboards, in stools, chairs, and tables, he will find

plenty of material for practice. Small hand models, in the shape of tins, pots, bottles, etc., can also be utilised as suggested in Fig. 1. Indeed, in these days of tinned and bottled goods, it is quite an easy matter to supply every child in an ordinary class with a well-formed cylinder or rectangular model for drawing purposes.

And once more with regard to the teacher's note-book. If only two or three small sketches were made weekly, then at the end of a year there should be a good supply of helpful drawings ready to hand and always "modern," for the principles of vision are in no danger of getting out of date. Such sketches would be useful for reference, for suggestion in regard to class teaching, and generally for the better equipment of the teacher.

The geometric models, by their hard lines and definite shapes, should be used in a course of object drawing; but we are of opinion that, as at present used, they do not contribute as they should to an intelligent course of the subject. By present methods of teaching model drawing, students are led to regard the exercises as an end in itself. They "get them off" for examination purposes, and when the examination is past both students and models go into retirement. It would be well if the examination consisted of two exercises, one of a group of geometric models, the other of a similar group of common objects of shapes, suggested and typified by the former, as in Figs. 2 and 3. Now, before we refer in detail to the accompanying drawings, we may as well state that they are not intended as copies to be practised and remembered. The whole intention of these articles will be missed if the student takes this view. We are not competing with those who are experts on "A System of Memory," but trying to show the student that imagination and reason (the use of common sense)



have a great deal to do with success in this art for which he so often says he "has no eye."

All outlines of objects may be classified into three divisions—namely, those bounded by straight lines, those by curved lines, and those by a combination of curved and straight lines. A better classification for practical purposes, however, is to divide them into (1) those based on the cylinder or cone; (2) those based on the prism; (3) details or adjuncts, such as handles, spouts, etc., which, while calling for special consideration, are still subject to the main principles governing object drawing. In the cylindrical or conical variety of objects can be included pots and pans, cups, tubs, barrels, basins, jugs, tins, and a variety of objects, the correct representations of which always depend upon the consistent relationship in drawing between the axis of the object and its circular ends. The drawing of the axis is a simple matter, for it only requires a single line; and it is scarcely necessary, we think, to enter into an explanation of this simple matter, important as it is. If the student will hold a pencil before him in various positions, he will not be long in discovering the connection between the changed appearances of the pencil consequent upon the changed positions.

The accompanying illustrations are based on the

representation of a circle combined with an axial line at right angles to it. This is the constructive basis of a great number of objects such as have been previously referred to. We have given here the circle in a horizontal position (Figs. 4, 5, 6), in a vertical position (Figs. 7, 8, 9), and in an inclined position (Fig. 10). There is little need to point out that the fullness or otherwise of the ellipses will, in the first case, depend on the angle at which the circle is viewed. It is not altogether drawing *an* ellipse, but *such* an ellipse which is consistent with the direction of view; so that, as can be seen in the sketch accompanying Fig. 5, the difference in fullness of the ellipses is consistent with their difference of height. The connection between Figs. 7, 8, and 9 will be observed, though a regular ellipse in the case of the scroll cannot by any means be guaranteed. The student should always draw the complete ellipse, even when, as in the case of the jar below the eye (Fig. 4), the whole of the base cannot be seen. The part, however, that is visible will determine the curvature of the unseen portion.

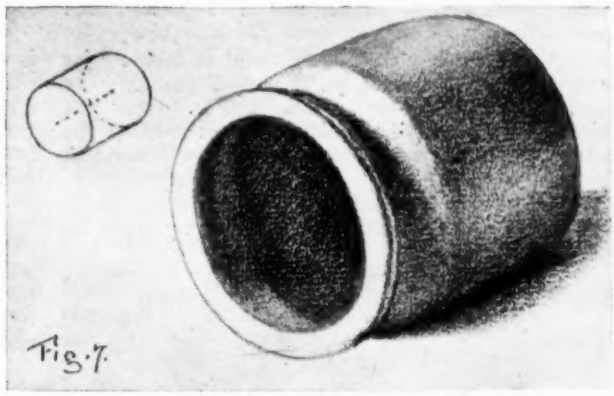


Fig. 7.

The most difficult task the student experiences in drawing the various ellipses representing the *vertical* circle is not so much in the proportions of the ellipse as in the position of the longest line of the ellipse—the major axis. We give an example in Fig. 7, illustrated also in the accompanying small sketch. The circular ends are upright—that is, they are in vertical planes—but

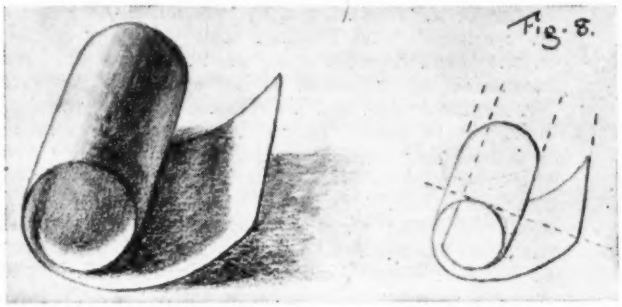


Fig. 8.

the longest line of the ellipse represented is here *not* a vertical line. This feature is generally something of a puzzle to beginners. And yet it can reasonably be accounted for, because when a circle is seen as an ellipse, the longest line of such an ellipse is the one that is at right angles to the view, the shortest line, of course, being the one *in the line* of view. Look at the base of the jar, for example (Fig. 10). There we have the representation of a figure that is a circle *really*. The *actual* length of all lines drawn through this circle is the same, but one of them will—indeed, *must*—appear longer than either of the others; and this is only a recurrence of the same principle which operates when any single straight line is looked at.

In the adjoining sketch to the same figure it will be noticed that the parallel curves of the base are not seen as such, and this is easily explained; for while the distance between the curves is *actually* the same throughout in the model, yet these wider portions at the extremities are portions of the longest line of the ellipse. If this whole line appears longer, equal parts of it will therefore appear longer here than in any part of the parallel circles.

This particular feature of the appearance of the circle has been dwelt upon, for it is a frequent source of misunderstanding, and its drawing often shows a lack of observation by the student. Seeing that we have to bear in mind the theoretical side of object drawing, we make no apology for dwelling on it now. The feature to which we have just called attention is another instance of the common-sense aspect of the subject. Before leaving these remarks, we impress upon the student the fact that in all cylindrical and conical objects there must always be a consistency maintained between the length and slope of the axial line, also between the representation of such axis and the proportions in size and shape of the accompanying ellipses. If the actual object to be represented has not been previously seen, then drawings showing the actual relation between the length, breadth,

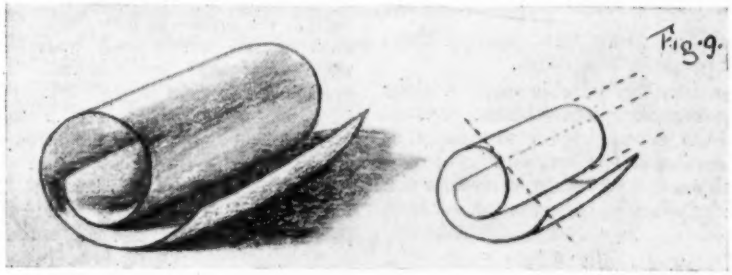


Fig. 9.

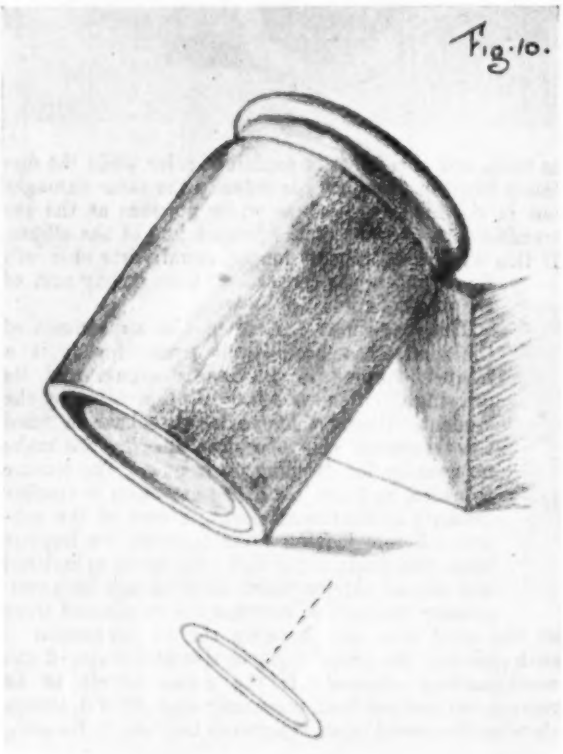
and height must be provided. We conclude by suggesting a series of exercises to grip the principles we have dwelt upon. Meanwhile, do not forget the notebook, and the odd times and places when and where it may be used to advantage.

Ex. 1.—A series of three drawings of an ordinary

tumbler standing in vertical position below the eye and at different distances. Draw from memory another similar set, the tumbler inverted. In all these see that the drawings of the ellipses are consistent with their increasing or decreasing distances from the eye, and that the relative difference in fullness of ellipses is shown between those of the mouth of tumbler and those of base.

Ex. 2.—A series of three drawings of an ordinary jar or circular tin, above the eye in vertical position—say on a shelf—portion of the base visible. Draw the object from three different distances, and see that the fullness of the ellipses increases as the eye is directed upwards.

A circular ceiling panel, gas reflector, etc., can be similarly treated. Assume that an ordinary basin be



placed in similar position. Draw the series of three drawings from similar *imagined* conditions.

Ex. 3.—Make three drawings of objects, as a clock face, a hanging hoop, circular picture-frame, etc., all in vertical positions, the actual circles to appear as ellipses. Note the direction of the longest line of each ellipse. Place on a table a reel of cotton or circular tin, and make another series showing a gradation of form in ellipses.

Ex. 4.—A series of drawings of a plainly constructed basin lying on its side and showing the ellipses in inclined positions.

All these can be executed in an ordinary sketch-book, and regarded as examples in illustration of principles. After the drawings have been made, the original object can be set up in the varying positions, and the accuracy of the sketches verified.

THE NEED FOR ACTUALITY IN TEACHING.

UNDER the above title Mr. J. Lewis Paton, Manchester, contributed a most interesting article to the April number of *Cassells's Magazine*, from which we take the following :—

"When the Secondary Education of Wales was organised at the end of last century, the Central Council, in planning out the new system, were confronted with the question : 'Will this extension of education make the poorer children of the community dissatisfied with their lot ? Will the youths hold manual work in contempt, and the girls turn up their noses at domestic work, whether in their own homes or other people's ? Are we simply going by our extended education to increase the supply of clerks, male and female, and divert into what Mr. Gladstone called "the paradise of pen and ink" those who are better fitted in every way, both by nature and social status, to earn their living with their hands ?'

"This is the stock argument of the reactionary who objects to this spread of education, really because he has to pay for it, ostensibly because it makes the rising generation too genteel to soil their hands. It is the regular croak of the croaker. But there is something in it. The engineers were beginning to find that the modern boy, though he was better equipped with head knowledge, was slower and clumsier with his hands. The lads were getting a great deal of education, but, as one of the foremen put it, 'precious little got into their fingers.' And England more than any country in the world depends upon the mechanical skill and mechanical inventiveness of her sons. At any rate, Mr. Arthur Acland and his Welsh Committee went the right way to work. They did not curtail educational facilities—they even extended them ; but they provided for manual training to be an integral part of their curriculum. Handcraft was to be trained along with braincraft ; there was to be no divorce between them. If the handworkers of the country were to have more brain culture, the brainworkers on their part were not to grow up, as hitherto, without hand culture. Skill of hand was to be honoured as well as bookish lore.

"The movement in Wales gave an impulse to the movement for manual training all over the country, and in course of time an unexpected discovery was made. The time given to handwork was necessarily so much time withdrawn from bookwork, and teachers quite anticipated that bookwork would suffer accordingly. So far from that being the case, it was found that schools which took manual work did better in their bookwork. In a school where the subject was grudgingly admitted, one of the governors who believed in it bearing the whole of the expense, half the school did manual work and the other half gave the extra time to the Code subjects ; and at the end of the year it was found that the boys who had done the manual work, in spite of the time handicap, beat the other half in their bookwork, and the teachers who had been at first most uncompromising in their opposition were convinced by the facts, and became the strongest advocates of the new subject. 'It is especially in geometry that we feel the benefit,' said one of these teachers. 'The boys realise now what planes and angles and triangles are, and they find out in the workshop how disastrous it is to be inaccurate in handling them ; their own mistakes find them out there in a way they

cannot evade or mistake. In fact, we regard the workshop as a practical laboratory for geometry, both plane and solid.'

"It is all that, and it is more. Psychologists tell us that the motions of the hand bring into play motor centres of the mind which are never stirred by book-learning. The activity of these new centres promotes the activity of the brain as a whole, and enhances its vitality, so that, rightly considered, paradoxical as it may seem to say so, the training of the hand is really training of the brain, and must form a part of any complete system of mental culture. The introduction of manual training has not only counteracted the snobbish notion that to work with the hands is not genteel; it has not only had its practical bearing on social life; it has done more: it has given new power to the mind, and that new inherent power is worth more than this or that piece of extra book-knowledge which might have been plastered on, never becoming part of the real mental contents, to be forgotten as soon as learned.

"'TEACH THE THING BEFORE THE SIGN.'

"The whole manual training movement is really part of a much larger movement for actuality in teaching. Like every vital truth, it ramifies out into all manner of unexpected directions. It is with education as with moral life: one plain duty faithfully fulfilled opens up new visions of truth beyond; he that doeth the will shall know of the doctrine. It is not really a new discovery, it is as old as Pestalozzi and Froebel; only man moves but slowly, and the teacher is but a man, and even education authorities are men.

"'Teach the thing before the sign; first get the actual sense-impression, then when that is duly apprehended, attach the definite name to it.' That is an accepted maxim of all pedagogic text-books. And yet it was only the other day that a teacher told me that he had been taken to task for conducting his class to the river which brawled just below his school so that they might observe there with their own eyes the phenomena of erosion and currents and alluvial deposit. Socrates is said to have brought philosophy down from the clouds, and Socrates had plenty of opposition in his day from those who objected to his bringing such things as boots and pots and bees and pilots into philosophical discussion. The business of education at the present time is to bring education down from the clouds, and it would help immensely to that end if we could abolish for a start such high-sounding titles as geography, physiography, geometry, and philology, substituting in their place the plainer Anglo-Saxon terms of earth-lore, earth-measurement, word-lore. There is much virtue or vice in a name. Children would realise from the homelier vocables that these school subjects had a practical bearing on their everyday life, on the earth which they trod, on the streets or the fields where they played, and on the words that they used. In fact, geography to be real starts with the actual classroom and makes a plan of it; geometry to be real starts with the measurement of it and the objects which it contains; and both broaden out gradually to the school buildings, the playground, and the country or the streets that lie beyond it.

"'Teach the thing before the sign.' The whole of the reform movement in language teaching is based on this principle. It starts with the boy's face, body, clothes, his pencil and pen and copybook, the furniture of the classroom, the actions of its inmates, and develops itself in ever-broadening circles with pictures and stories, and dramatic representations carried out by the pupils themselves. It is concrete throughout. It does not neglect grammar, but it learns the grammar of the foreign language as we learned the grammar of our mother tongue, which we used first and discovered afterwards, like the Bourgeois Gentilhomme. 'Teach the thing first and then the sign.' Applying this to language, we say: 'Teach first the instance, many instances, and then deduce the law; or, better still, let the class deduce it for themselves: they are much more likely to remember then.' This is a corollary as plain as plain can be, and yet one could venture to say that in over 90 per cent. of English schools we are still using Latin grammars and exercise books which first state the rule and then give strings of examples, all absolutely incoherent and mostly meaningless, to the translation of which the rule is to be applied. The books are excellent, only they build the pyramid on its apex instead of its base."

THIRD INTERNATIONAL ART DRAWING CONGRESS, LONDON.

THE Hungarian Ministry of Public Instruction is taking an even keener interest in the Drawing Congress of August, to be held at the Imperial Institute in South Kensington, than the corresponding Ministries in other countries of Europe. Not only does the Austro-Hungarian Government send delegates and exhibits at the national cost, but from Hungary a donation of 200 crowns has just been contributed to the Congress Fund. The growth of art industries in that country was discovered last year by the Chamber of Commerce delegates who made a tour of its schools and colleges. It had in recent years been extraordinary, and the delegates noted especially that manufacturers were backing the schools of design with enthusiasm. A good many Congress delegates from other countries are assisted or appointed by their Governments, but European Governments have not hitherto given money to the British fund, which can be granted nothing by our own Treasury. The Government of Newfoundland, however, has subscribed $1,000. Other and unannounced donations are 20 guineas from the Society of Art Masters, 10 guineas from the city of Coventry, £10 (promised) from the Worcestershire Education Committee, and £5 from the Girls' Public Day School Trust.

NELSON'S GUIDE BOOKS.

Sixpence Each Net.

THESE excellent guide books come at a most appropriate time. June turns the thoughts holidaywise: Thirteen books have already been issued—namely, Paris (9d.); The Wye Valley; York; Plymouth and Dartmoor; Ilfracombe, Lynton, and Lynmouth; Torquay and Exeter; Aberystwyth; Falmouth and The Lizard; Brighton, Hove, and Worthing; Scarborough and Whitby; Llandudno and Conway; Hastings to Bexhill; Bettws-y-Coed and Snowdon. The letterpress portion is exactly like the familiar and trustworthy Baedeker. Excellent maps, not only of the country, but of the principal towns too, are given. The size is just convenient for the pocket, and both cyclists and pedestrians will find these guides valuable and reliable.

EDITORIAL NOTES.

We hope to give the first drawings for the "Honours Page" next month.

* * * * *

Mr. H. Tunaley, H.M.I., Chief Adviser to the Board of Education for Drawing, has been appointed Inspector of Drawing in the Training Colleges. Mr. Tunaley brings to this work the ripe judgment of a long, practical experience of schools and colleges and unbounded enthusiasm for the welfare of art on education. With the complete control of all art work as it affects education in his hands, we look forward to the future with all confidence.

* * * * *

The manual training movement is decidedly on the up grade. No less than six courses are to be held in England during the summer, as follows :—

Ambleside.—Mr. J. Phillips, Rothay Holme, Ambleside.

Barry.—Mr. A. Sutcliffe, 21 Morlais Street, Roath, Cardiff.

Carnarvon.—Mr. Thomas, Education Office, Carnarvon.

Scarborough.—Mr. J. Spittle, 47 Spring Street, Huddersfield.

Brighton (N.A.M.T.T.).—Mr. J. H. Naylor, The Limes, Welling, Kent.

Abergele.

In Scotland :—

St. Andrews.—Drawing, modelling, etc. The Director of Studies, 77 North Street, St. Andrews.

Dunfermline.—Woodwork. Mr. Mitchell, County Buildings, Cupar-Fife.

Abroad the chief courses are :—

Nääs.

Notwithstanding the lamented death of Herr Salomon these courses will be held as usual this year. They are arranged in the following order :—

Sloyd Courses.

No. 112. From June 10 to July 21. Fee, 36 Kr.
No. 113. From July 29 to September 8. Fee, 36 Kr.

Courses for the Teaching of Games.

No. 24. From June 10 to July 21. Fee, 36 Kr.
No. 25. From July 29 to August 25. Fee, 24 Kr.

Gardening Course.

From June 10 to August 25.

Leipzig.

Courses are arranged in the following subjects :—
Modelling, metal work, or wood-carving. Fee, 54 Mks.
Construction of apparatus. Fee, 65 Mks.
Cardboard work. Fee, 60 Mks.
Joiners' Work. Fee, 90 Mks.
Glass work. Fee, 15 Mks.

Courses commence on July 8, and are continued throughout August. Students may enter on July 8, July 13, or August 3.

For full particulars of Nääs and Leipzig courses send stamped envelope to Mr. J. Cooke, 131 Percy Road, Shepherd's Bush, London, W.

Sir Harry R. Reichel, chairman of the Board of Examinations for Educational Handwork, and an enthusiastic "Sloyder," has written a charming "personal appreciation" of the late Otto Salomon. Though printed for private circulation only, we have no doubt that if a stamped addressed foolscap envelope be sent to Mr. Spittle, 47 Spring Street, Huddersfield, he would forward a copy.

* * * * *

In the *Manual Training Teacher* for April Mr. Bennett, editor of the *Manual Training Magazine*, Peoria, U.S.A., gives the following reasons for the value of the educational press to the teacher :—

"First : It keeps reminding him of his ideals. Every teacher is in danger of dropping down at times, and needs the spur of having his ideals constantly before him. Moreover, most of our ideals are in need of further development, and this can be done in no more effective way than by a progressive educational journal.

"Second : It gives him the latest thought on his speciality, and tells him of new things that are being tried and found successful. It thus helps him to keep out of the rut of unthinking repetition.

"Third : It stimulates him to record his own thoughts and experiences for the benefit of his fellows, and thus contribute to the common good.

"Fourth : It furnishes numerous practical suggestions, which are sure to make his work the richer.

"Fifth : It lets him know what his fellow-teachers in other communities or other countries are doing, and thus stimulates in him a fraternal feeling which may develop into a strong professional spirit. And perhaps this is the best thing that the departmental journal can hope to accomplish, because the right kind of professional spirit involves all the others. It ensures growth in ideals and constant searching for better means of attaining these ideals, and encourages the teacher to give freely to the common good from his storehouse of thought and experience."

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Our Query Column.

SOLUTIONS BY A. CLEMENT JONES, M.A., PH.D., SENIOR MATHEMATICAL MASTER, BRADFORD GRAMMAR SCHOOL.

RULES.

1. Each correspondent is restricted to *one* question.
2. Each query must be accompanied by the name and address of the correspondent, and the *coupon* which appears on the back wrapper of the current number of the Journal.
3. CORRESPONDENTS MUST IN ALL CASES STATE THE SOURCE FROM WHICH THEIR QUERY HAS BEEN OBTAINED.

The Editor reserves to himself the right to decline to answer any question which is, in his judgment, unsuited to the Magazine.

Cymru.—Solve the simultaneous equations—

$$18y^x - y^{2x} = 81\,;\ 3^x = y^2.$$

The first equation is quadratic in y^x, and can be written—

$$(y^x)^2 - 18y^x + 81 = 0\,;$$

that is, $$(y^x - 9)^2 = 0,$$

therefore $$y^x = 9, \text{ or } y^x = 3^2. \quad . \quad . \quad . \quad . \quad . \quad (1)$$

The second equation gives

$$y^2 = 3^x, \text{ hence } y = 3^{\frac{x}{2}}, \text{ therefore } y^x = 3^{\frac{x^2}{2}}.$$

Combining this with the result (1), we have

$$3^{\frac{x^2}{2}} = 3^2, \text{ hence } x^2 = 4, \text{ or } x = \pm 2.$$

To get the corresponding values of y, substitute in the second equation. This gives

$$y^2 = 3^2, \text{ or } y^2 = 3^{-2},$$

hence $$y = \pm 3, \text{ or } y = \pm \tfrac{1}{3}.$$

The sets of simultaneous values are therefore

$$x = 2,\ 2,\ -2,\ -2.$$
$$y = 3,\ -3,\ \tfrac{1}{3},\ -\tfrac{1}{3}.$$

If Cymru has learned logarithms, the latter part can be simplified. For result (1) and the second equation give

$$x \log y = 2 \log 3, \text{ and } x \log 3 = 2 \log y.$$

Multiplying corresponding sides of these equations, and dividing each side by the product $\log y, \log 3$, it follows at once that $x^2 = 4$—that is, $x = \pm 2$.

J. W. H.—In problems dealing with the reactions at joints the only real difficulty arises when a string or rod exerts a tension or thrust at the joint. It is then often impossible to discover *à priori* how this force is distributed between the two rods. In such cases it is safest to find the tension or thrust by considering some two or three of the rods as a system, including the joint in question. The action and reaction at the joint then balance each other, and do not appear in the mechanical equations for equilibrium. Another method, often very effective, is to suppose the joint replaced by a smooth pivot or particle, whose mass can be neglected, to which the rods and the additional string or light rod are supposed attached. The conditions of equilibrium are not disturbed by this substitution, and the equations for the equilibrium of the pivot or particle give the force required. This method must not be used when the action at the joint is required. The third method and the most effective is the application of the principle of virtual work.

Three main points relative to the action at joints should be noted—

(*a*) If the forces acting on the system are symmetrical about a line through a hinge, the action and reaction at this hinge are at right angles to this line. For suppose there were any component parallel to this line, by Newton's Third Law these components are equal and *opposite*, by symmetry they are equal and *in the same direction;* hence each is zero. For example, in the question sent the reaction at the hinges A and C must be horizontal. (See Fig. 2.)

(*b*) If a rod has no weight and no force acts on it at any point in its length (such as the tension of an attached string), then the action of the hinges at its ends must act along the rod, for the rod is in equilibrium under two forces—namely, the resultant actions of the hinges at its ends, and these forces must hence be equal and opposite. In such cases the actions at the hinges can be replaced by tensions or thrusts along the rods, and the conditions of equilibrium are unaltered by replacing the hinges by particles acted on by such forces.

Ex. Four rods jointed at their ends form a quadrilateral which may be inscribed in a circle. If they be kept in equilibrium by two strings joining the opposite angular points, show that the tension of each string is inversely proportional to its length, the weights of the rods being neglected.

(*Note.*—Replace the joints by particles to which the rods and strings are attached. Use Lami's theorem for the forces at two consecutive corners, and the result follows.)

(*c*) Much labour can be saved by the application of these principles, combined with a little common sense. It is customary in text-books to replace the actions and reactions at each joint by pairs of perpendicular components, X_1Y_1, X_2Y_2, etc., and then write down a list of equations, often so long as to be very confusing. It is almost invariably better to select one suitable, if possible symmetrically placed, joint, and replace the action and reaction at this joint by two pairs of equal and opposite perpendicular components. Then work round the figure, mentally resolving in directions parallel to the chosen components (usually vertically and horizontally), putting in the values of the actions. Compare the illustrative example given in Loney with Fig. 1.

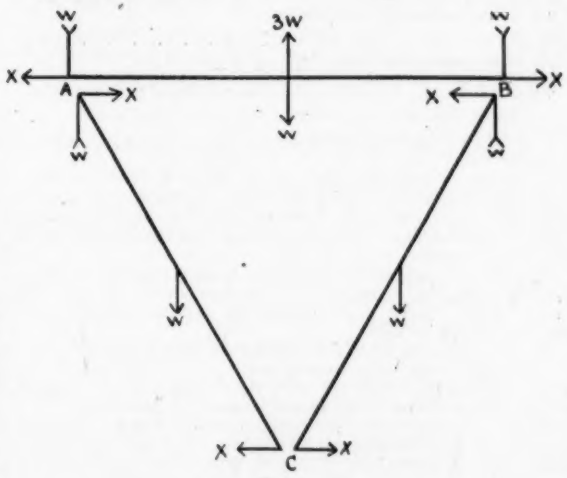


FIG. 1.

Here, since the forces are symmetrical about the vertical through C, the action and reaction at C are horizontal; call them X. This is the only horizontal force acting on the rod BC, except that at the hinge B. The horizontal component of the action at B is therefore also X in the opposite direction. Also the only vertical force other than at B is W, hence the vertical component at B is W upwards. The reaction on the rod AB of the hinge at B is equal and opposite to its action on CB. These forces can be at once filled in as in the figure. Fill in for AC symmetrically, and treat AB in a similar manner. The whole question is now solved by taking moments about B for the rod BC.

Question.—A square figure ABCD is formed by four equal uniform rods jointed together, and the system is suspended from A and kept in the form of a square by a string connecting A and C. Show that the tension of the string is half the weight of the four rods, and find the magnitude and direction of the action of the joint B or D.

The actions at B and D are the same by symmetry. Let their horizontal and vertical components be X and Y, and let T be the tension of the string. First consider the two

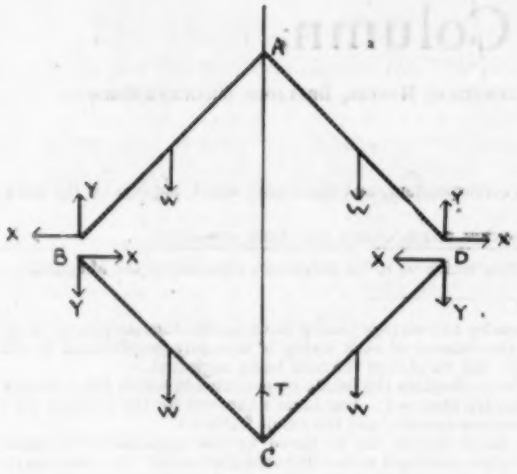


FIG. 2.

rods BC and CD together as one system. The actions at C are internal forces and do not appear. Resolve vertically,

$$T = 2W + 2Y. \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (1)$$

Take moments about C for the rod CB, thus avoiding the unknown action at C.

$$W + 2Y - 2X = 0. \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (2)$$

(A side of the square is called $2\sqrt{2}$ units)

Again, take moments about A for the rod AB, again avoiding unknown forces at A.

$$W - 2Y - 2X = 0. \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (3)$$

From (2) and (3), $W = 2X$ and $Y = 0$,

hence from (1), $T = 2W$ = half the weight of the four rods.

The action at B or D is horizontal and equal to $\frac{1}{2}W$.

J. W. H. will find the following exercises illustrate the hints given:—

(i) Four equal uniform rods, each of weight W, are jointed so as to form a rhombus ABCD. The system rests on a horizontal plane with AC vertical; BD are connected by a light string. Show that its tension is 2W . tan ½BAD, and find the action on the rods at A and C.

(ii) Five rods are jointed so as to form a regular pentagon ABCDE suspended from A. Two strings connect C with the middle points of AE, and D with the middle point of AB. Determine their tensions.

(iii) Two equal uniform rods are jointed at one end and stand in a vertical plane on a smooth table. Their mid-points are connected by a light rod. What is the direction of the reaction at the joint, and why? What is the tension in the light rod?

(The Editor will be glad to receive solutions of these questions from J. W. H., if accompanied by the usual coupon. State definitely any difficulties you still find with this type of question.)

Campbell.—A conical glass tube 20 cms. long, 0·3 cm. in diameter at one end and 0·1 cm. in diameter at the other end, is fixed vertically, with its larger end just touching the surface of some water whose surface tension is 80 dynes per cm. Calculate the height to which the water will rise in the tube.

The point of this question is probably that only a small length of the tube will be occupied by the water, and consequently the variation in diameter through this short length will be very small.

A general equation giving the height (h cm.) can be found thus—

Suppose that a height H cm. must be added to complete the cone of which the tube is a part, then

$$H : \cdot1 = H + 20 : \cdot3, \text{ or } H = 10 \text{ cm.}$$

Hence the vertical angle (2α) of the cone is $2 \cdot \tan^{-1} 1/200$—that is, about 34′. Hence, if the radius at a height h be r, we have $h = 30 - 200r$.

Suppose the radius of the section of the cone at the surface of the water is r cm., then equating the vertical component of the surface tension to the weight of liquid supported ($g = 981$),

$$2\pi r \times 80 \times \cos\alpha = 981\{\tfrac{1}{3}\pi \times (\cdot15)^2 \times 30 - \tfrac{1}{3}\pi r^2 \cdot 200r\},$$

which gives, if we take $\cos\alpha = 1$,

$$\frac{200r^3}{3} + \frac{160r}{981} = \frac{9}{40}. \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (1)$$

The following method gives a very approximate result:—

Suppose the glass tube is cylindrical and of uniform bore, diameter 3 mm., the height (h cm.) to which the liquid would rise is given thus—

Since the angle of contact is 0°, and therefore the surface tension acts vertically, equating this force to the weight of the column of liquid supported ($g = 981$),

$$2\pi \times \cdot15 \times 80 = \pi \times (\cdot15)^2 \times h \times 981.$$

$$\therefore h = \frac{160}{981 \times \cdot15}.$$

Hence $$h = 1\cdot087 \text{ cm.}$$

In the actual case the radius of the section at the surface of the water will be slightly smaller, and hence the surface tension will be smaller. On the other hand, the average section will be smaller, and the weight of the water supported smaller. The result will be nearly true.

Now assume as a second approximation that the tube is a cylinder, but as the height of the water is about 1·1 cm., take the radius of the cylinder to be the average radius of the cone through this length—namely, ½(·15 + ·1445) = ·1472 cm. Calculate the height h as in the first approximation. Thus

$$h = \frac{160}{981 \times \cdot1472} = 1\cdot108 \text{ cm.}$$

This we take as the result. The radius at this height is ·1446 cm., and if this be substituted in equation (1) we obtain—

left-hand side = ·20156 + ·02358 = ·22514.

right-hand side = ·225,

showing the result is very approximate.

The two results obtained differ only by ·021 cm., and considering the difficulty of measuring this height experimentally, it is probable the examiner only required the first, desiring to find out how far the candidates realised the circumstances of the experiment.

John Thomas.—Solve the equations—

(i) $x^2 + y^2 = m^2 + n^2$, $x^2 + xy = m(m + n)$.

We have $(m^2 + mn)(x^2 + y^2) = (m^2 + n^2)(x^2 + xy)$,

hence $n(m - n)x^2 - (m^2 + n^2)xy + m(m + n)y^2 = 0$.

that is, $(nx - my)\{(m - n)x - (m + n)y\} = 0$,

therefore either $nx = my$ or $(m - n)x = (m + n)y$.

Substitute these results in the second equation, hence

$$x^2 + \frac{n}{m}x = m(m + n), \text{ or } x^2 = m^2; \text{ that is, } x = \pm m.$$

One solution is therefore $x = \pm m$, $y = \pm n$,

or $$x^2 + \frac{m - n}{m + n}x^2 = m(m + n);$$

that is, $$x^2 = \tfrac{1}{2}(m + n)^2.$$

Therefore another solution is

$$x = \pm \frac{1}{\sqrt{2}}(m + n), \; y = \pm \frac{1}{\sqrt{2}}(m - n).$$

(ii) $$x^2 - 7y = 2x \; . \; . \; . \; . \; . \; . \; . \; . \quad (1)$$

$$y^2 - 7x = 2y \; . \; . \; . \; . \; . \; . \; . \; . \quad (2)$$

or $$x^2 = 7y + 2x,$$

$$y^2 = 7x + 2y.$$

Adding $$x^2 + y^2 = 9(x + y),$$

therefore $$x + y = 0, \text{ or } x^2 - xy + y^2 = 9.$$

Subtracting $$x^2 - y^2 = -5(x - y),$$

therefore $$x - y = 0, \text{ or } x^2 + xy + y^2 = -5.$$

Hence (a) if $x + y = 0$, and $x - y = 0$,

then $x = 0$, and $y = 0$.

(b) If $x + y = 0$, and $x^2 + xy + y^2 = -5$,

then $x = \pm\sqrt{-5}$, $y = \mp\sqrt{-5}$.

(c) If $x - y = 0$, and $x^2 - xy + y^2 = 9$,

then $x = \pm 3$, $y = \pm 3$.

All the solutions are therefore

$$x = 0, \; \sqrt{-5}, \; -\sqrt{-5}, \; 3, \; -3.$$

$$y = 0, \; -\sqrt{-5}, \; \sqrt{-5}, \; 3, \; -3.$$

W. H. Edge.—(1) If the tangents of the angles of a triangle are in arithmetical progression, show that the squares of the sides are in the ratios

$$x^2(x^2+9) : (3+x^2)^2 : 9(1+x^2).$$

Let $\tan A = x$, $\tan B = y$, $\tan C = z$,

and either $x > y > z$ or $x < y < z$.

Hence B is $<$ A or $<$ C, and therefore *acute*.

By hypothesis, $x + z = 2y$. . . . . (1)

And since $\tan(A + B + C) = 0$,

we have $\tan A + \tan B + \tan C = \tan A \tan B \tan C$,

or $x + y + z = xyz$. . . . . (2)

Hence $3y = xyz$, and $xz = 3$, for $y = 0$, since B is acute.

Therefore $z = \frac{3}{x}$, and $y = \frac{1}{2}\left(x + \frac{3}{x}\right) = \frac{3+x^2}{2x}$.

Now $a^2 : b^2 : c^2 = \sin^2 A : \sin^2 B : \sin^2 C$

$$= \frac{\tan^2 A}{1+\tan^2 A} : \frac{\tan^2 B}{1+\tan^2 B} : \frac{\tan^2 C}{1+\tan^2 C}$$

$$= \frac{x^2}{1+x^2} : \frac{y^2}{1+y^2} : \frac{z^2}{1+z^2}$$

$$= \frac{x^2}{1+x^2} : \frac{(3+x^2)^2}{4x^2+(3+x^2)^2} : \frac{9}{x^2+9}$$

$$= \frac{x^2}{1+x^2} : \frac{(3+x^2)^2}{(1+x^2)(9+x^2)} : \frac{9}{x^2+9}$$

$$= x^2(x^2+9) : (3+x^2)^2 : 9(1+x^2).$$

(2) In any triangle show that

$$abc(1 - 2\cos A \cos B \cos C) = a^2 . \cos B \cos C + b^2 . \cos C \cos A + c^2 . \cos A \cos B.$$

$$\sin^2 A . \cos B . \cos C + \sin^2 B . \cos C . \cos A + \sin^2 C . \cos A . \cos B$$

$$= \sin A . \cos B . \cos C(1 - \cos^2 A) + \sin B . \cos C . \cos A(1 - \cos^2 B) + \sin C . \cos A . \cos B(1 - \cos^2 C)$$

$$= (\sin A . \cos B . \cos C + \sin B . \cos C . \cos A + \sin C . \cos A . \cos B) - \cos A . \cos B . \cos C(\sin A \cos A + \sin B \cos B + \sin C \cos C)$$

$$= \sin(A + B + C) + \sin A . \sin B . \sin C - \tfrac{1}{2}\cos A . \cos B . \cos C(\sin 2A + \sin 2B + \sin 2C)$$

$$= \sin A . \sin B . \sin C - \tfrac{1}{2}\cos A . \cos B . \cos C . 4 \sin A . \sin B . \sin C$$

$$= \sin A . \sin B . \sin C(1 - 2\cos A . \cos B . \cos C),$$

and $\sin A : \sin B : \sin C = a : b : c$, hence, etc.

(3) The difference between the areas of the hexagon and pentagon circumscribed about a circle is 5 sq. ft. Show that the square of the radius can be found in the form $\frac{\cos\theta . \cos 36^\circ}{\sin(36^\circ - \theta)}$, and calculate θ and the length of the radius of the circle.

If r is the radius of the circle, the area of the pentagon (regular) is $5 . r^2 . \tan 36^\circ$, and that of the hexagon $6r^2 \tan 30^\circ$, or $2\sqrt{3} . r^2$.

Hence $5r^2 . \tan 36^\circ - 2\sqrt{3} . r^2 = 5$,

or $$r^2 = \frac{5\cos 36^\circ}{5\sin 36^\circ - 2\sqrt{3}\cos 36^\circ}.$$

Now suppose $x . \cos\theta = 5$, and $x . \sin\theta = 2\sqrt{3}$, then substituting and cancelling x,

$$r^2 = \frac{\cos\theta . \cos 36^\circ}{\sin 36^\circ \cos\theta - \cos 36^\circ \sin\theta} = \frac{\cos\theta . \cos 36^\circ}{\sin(36^\circ - \theta)}.$$

This substitution is allowable for values of x, and θ can be found thus—

$$x^2 = x^2\cos^2\theta + x^2\sin^2\theta = 25 + 12 = 37,$$

and $$\tan\theta = \frac{x . \sin\theta}{x . \cos\theta} = \frac{2\sqrt{3}}{5} = \cdot 4 \times \sqrt{3}.$$

The calculation of θ is a simple exercise in tabular logarithms. The result is 34° 42′ 51″. This should be substituted in the value of r^2, and r can then be calculated.

W. L.—If $r < 1$ and positive, and m is a positive integer, show that $(2m+1)r^m(1-r) < 1 - r^{2m+1}$. Hence show that nr^n is indefinitely small when n is indefinitely great.

(Hall and Knight's *Algebra*.)

This inequality is an immediate case of "the geometric mean of any number of positive quantities is less than their arithmetic mean." Thus

$$\{1 . r . r^2 \ldots r^{2m}\}^{\frac{1}{2m+1}} < \frac{1 + r + r^2 + r^3 + \ldots + r^{2m}}{2m+1},$$

hence $$\{r^{1+2+3+\ldots+2m}\}^{\frac{1}{2m+1}} . (2m+1) < \frac{1 - r^{2m+1}}{1-r};$$

that is, $$(2m+1)r^m(1-r) < 1 - r^{2m+1},$$

for $1 + 2 + 3 \ldots + 2m = m(2m+1)$, and $1 - r$ is positive, so that each side of the inequality can be multiplied by it. The question, however, occurs in Hall and Knight before the chapter on inequalities. The following is a more elementary solution:—

$$(1 + r + r^2 + \ldots + r^{2m-1} + r^{2m}) - (2m+1)r^m$$

$$\equiv (r^{2m} - 2r^m + 1) + r(r^{2m-2} - 2r^{m-1} + 1) + r^2(r^{2m-4} - 2r^{m-2} + 1) + \ldots + r^{m-1}(r^2 - 2r + 1)$$

$$\equiv (r^m - 1)^2 + r(r^{m-1} - 1)^2 + r^2(r^{m-2} - 1)^2 + \ldots + r^{m-1}(r-1)^2.$$

Every term of this is positive, hence

$$(2m+1)r^m < 1 + r + r^2 + \ldots + r^{2m};$$

that is, $$(2m+1)r^m(1-r) < 1 - r^{2m+1}.$$

Now $\frac{1 - r^{2m+1}}{1-r}$, since $r < 1$, becomes, when m is very great, more and more nearly equal to $\frac{1}{1-r}$. We say the limiting value of $\frac{1 - r^{2m+1}}{1-r}$, when m is infinitely large, is $\frac{1}{1-r}$. Multiply each side of the inequality just proved by r^{m+1}.

$$\therefore (2m+1)r^{2m+1} < \left(\frac{1 - r^{2m+1}}{1-r}\right) . r^{m+1}.$$

Hence, when m becomes infinitely large, $(2m+1)r^{2m+1}$ is always less than $\frac{1}{1-r}$ times r^{m+1}, but $\frac{1}{1-r}$ is a finite quantity, while r^{m+1}, since r is < 1, is infinitely small. Therefore $(2m+1)r^{2m+1}$ becomes indefinitely small when m becomes indefinitely great. Write n for $2m+1$, and the required result follows.

Anon.—A bottle filled with water weighs 37·5 oz., when filled with a liquid it weighs 36·3 oz. If the specific gravity of the liquid is 0·96, find the weight of the bottle.

The water and the liquid occupy the same volume. Hence the weight of the liquid is 0·96 times that of the water; consequently

wt. of water + wt. of bottle = 37·5 oz.,

·96 × wt. of water + wt. of bottle = 36·3 oz.;

that is, ·04 × wt. of water = 1·2 oz.,

hence wt. of water = 30 oz.,

and wt. of bottle = 37·5 − 30 = 7·5 oz.

Note.—The Query Editor will be obliged if correspondents will state, when possible, the nature of the difficulty which they have found with a problem. It is not always possible to decide whether the querist has failed to understand the principles involved in the problem or has found merely some difficulty in the manipulation of equations. For example, in the query sent by "Campbell" this month his difficulty might be the general one of surface tension or only the particular form in which the problem was set. The Editor chose the latter alternative. In short, the more clearly querists present their difficulties the more useful this column will be to them and to other readers.

NEXT MONTH.

The PRACTICAL TEACHER for July will contain:—

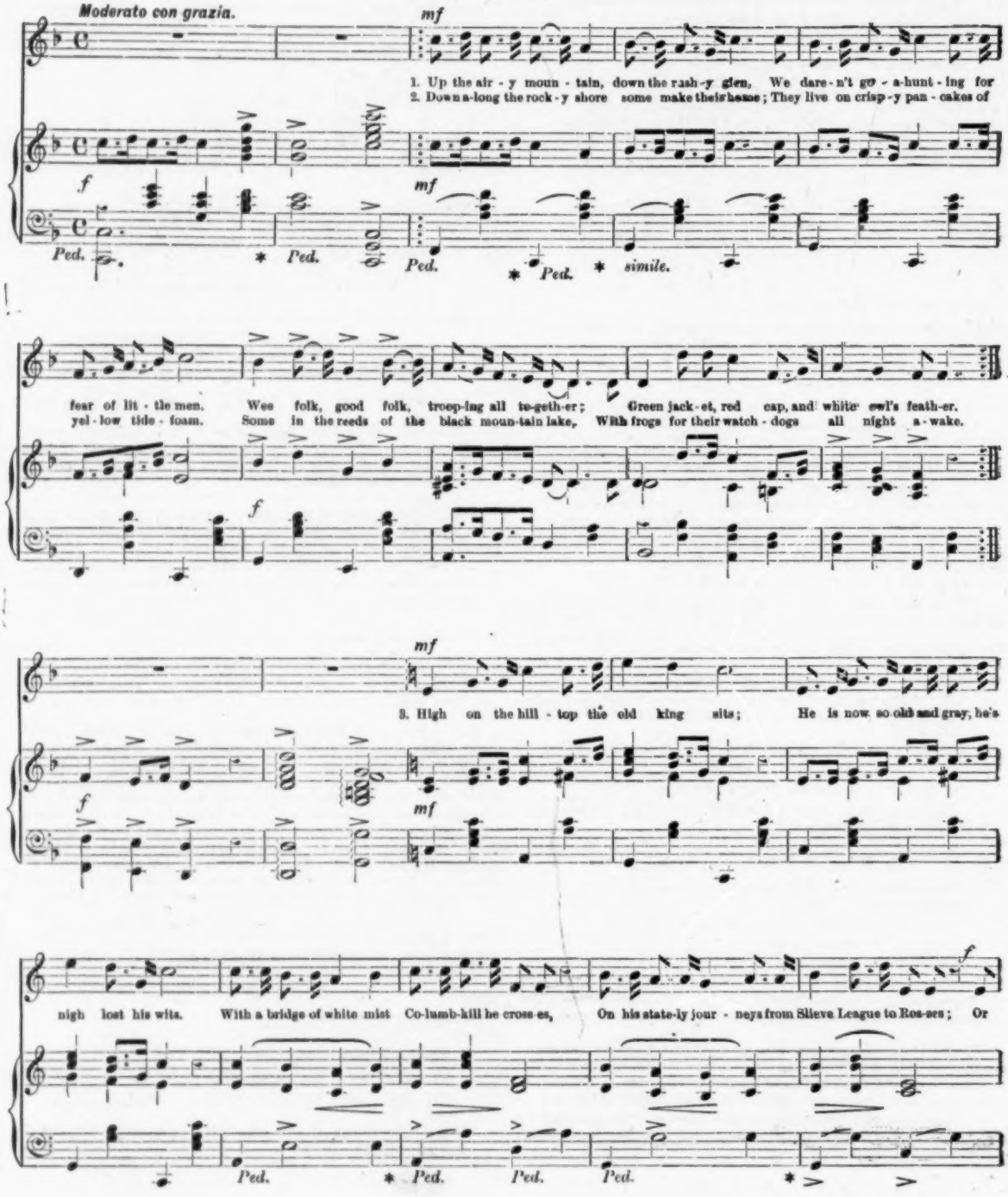
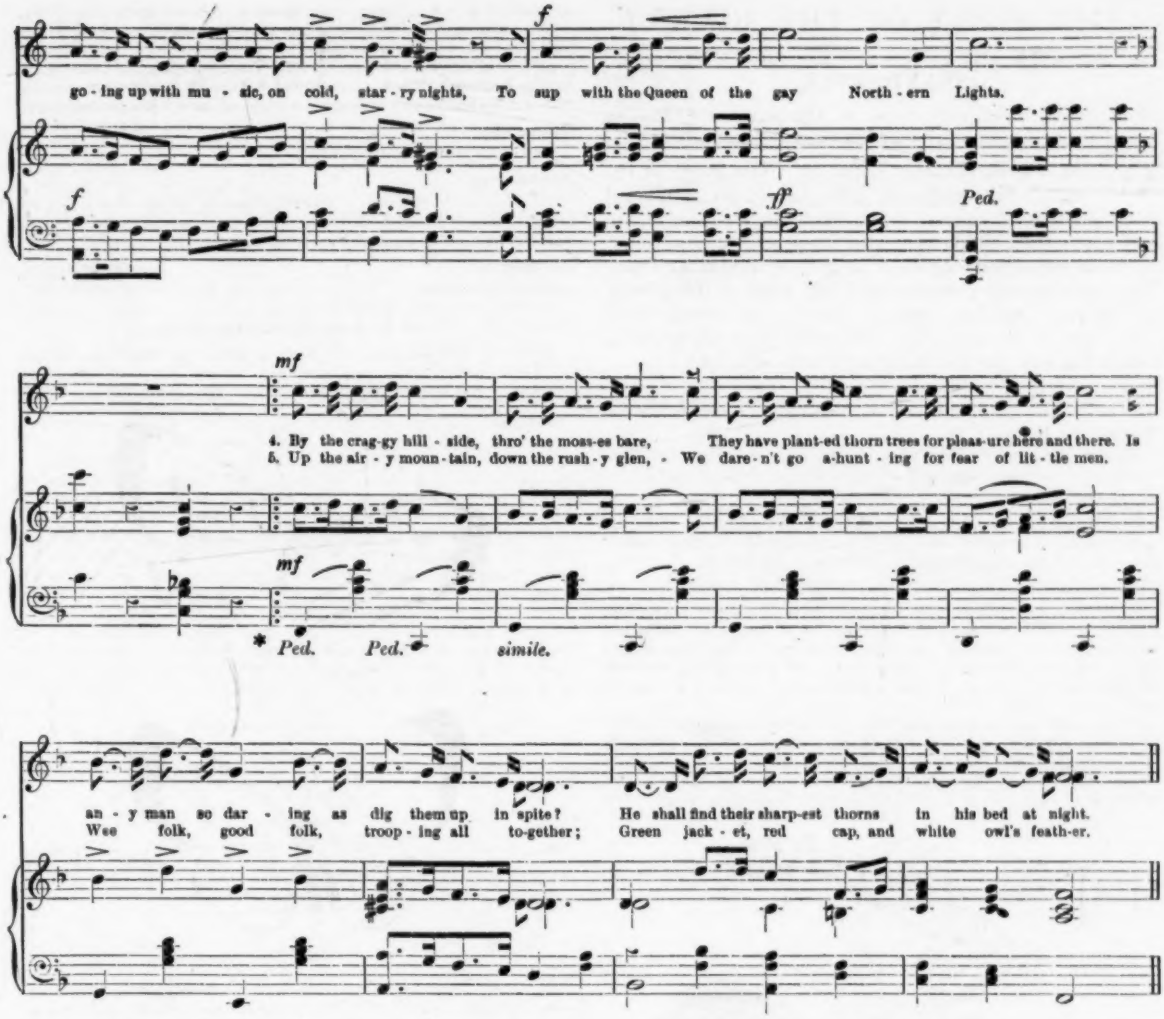
1. Special Holiday Articles.
2. Special Reviews of—
   (*a*) Mr. Sneyd-Kynnersley's *H.M.I.*
   (*b*) Dr. Duncan's *Life and Letters of Herbert Spencer.*
3. An interesting Paper on the Suggestions on Rural Education.

READY June 26. ORDER EARLY.

Papers for Teachers of Infants.

THE FAIRIES.

UNISON SONG.

Words by W. ALLINGHAM. *Music by* SEYMOUR BENSON.

Moderato con grazia.
mf
1. Up the air - y moun - tain, down the rash-y glen, We dare-n't go - a-hunt - ing for
2. Down a-long the rock - y shore some make their home; They live on crisp - y pan - cakes of
f
mf
Ped. * Ped. Ped. * Ped. * simile.
fear of lit - tle men. Wee folk, good folk, troop-ing all to-geth-er; Green jack-et, red cap, and white owl's feath-er.
yel - low tide - foam. Some in the reeds of the black moun-tain lake, With frogs for their watch - dogs all night a - wake.
f
mf
3. High on the hill - top the old king sits; He is now so old and gray, he's
f
mf
nigh lost his wits. With a bridge of white mist Co-lumb-kill he cross-es, On his state-ly jour - neys from Slieve League to Ros-ses; Or
f
Ped. * Ped. Ped. Ped. *

go - ing up with mu - sic, on cold, star - ry nights, To sup with the Queen of the gay North - ern Lights.
Ped.
4. By the crag-gy hill - side, thro' the moss-es bare, They have plant-ed thorn trees for pleas-ure here and there. Is
5. Up the air - y moun - tain, down the rush - y glen, - We dare - n't go a-hunt - ing for fear of lit - tle men.
Ped. Ped. simile.
an - y man so dar - ing as dig them up in spite? He shall find their sharp-est thorns in his bed at night.
Wee folk, good folk, troop - ing all to-gether; Green jack - et, red cap, and white owl's feath-er.

EDUCATIONAL GLEANINGS.

BY T. G. TIBBEY, B.A.

Corporal Punishment in French Schools.

IN the course of a series of articles which appeared in the *Practical Teacher* during the summer of 1906 (June, July, and September issues), Mr. B. Dumville called attention to the serious effects on the discipline and moral tone of French schools entailed by the absence of corporal punishment. In *L'Educateur Moderne* for June last, Dr. J. Philippe endeavours to discount this criticism; yet whilst he defends the prohibition of corporal punishment, he protests against the uniformity of treatment meted out to children of different characters which in large measure is a resultant. He also admits that many difficulties have arisen, and that the number of children who show themselves beyond control in school under ordinary conditions tends to increase in a most disquieting manner. Into the causes of this he does not enter, however, but for remedy he supports the demand which he says is made by all the teaching body—that special classes be established for pupils intellectually and morally abnormal; and for these he would have devised a special *régime*, from which, however, *corporal punishment would not be necessarily excluded*. He regards persistently intractable pupils as morally abnormal, and suggests that a medico-pedagogical committee should consider what might safely be borrowed from the English system for their benefit. In most cases he trusts that the threat alone would be sufficient. Where this failed, then should the committee have recourse to corporal punishment, even as the physician has recourse to the surgeon. One feels that conditions in France must indeed be serious, and that Mr. Dumville's strictures are fully justified, and wonders whether, after all, the appeal to bodily chastisement might not well have been made earlier and entrusted to the school authorities, who are at least as likely to know the child as any learnedly entitled committee. By the side of this put the appeal signed by 83 per cent. of school principals in New York for power to inflict corporal punishment, in spite of the establishment of special classes for incorrigibles, and one concludes that all is not well where it is prohibited.

THE STORY OF THE RIVER.

A SCHEME OF CONNECTED LESSONS FOR STANDARD I.

BY E. MONA CLAY AND R. M. M. ATKINSON, INSPECTORS OF SCHOOLS, MANCHESTER EDUCATION COMMITTEE.

WITH this month our course on "The Story of the River" is completed. We have tried to make it a comprehensive scheme; for, while emphasising again and again the central idea and its special connections, we have expanded our view to include plants and animals and natural phenomena which depend for growth and beauty, maybe, not only on the existence of the river, but on the moisture and revivifying powers conveyed through the soil to living things around.

I.—SKETCH OF A LESSON ON THE BUTTERFLY.

Required for Lesson.

Specimens of caterpillars, chrysalides, etc.; also sketches illustrating the various stages in the development of the butterfly.

Preparation.

Recall the lessons the children have already had on different insects—the dragon-fly, bee, etc.—and question to find out if they can tell the characteristics common to all insects.

Presentation.

I. General Appearance of the Butterfly.—Show coloured sketches, and let the children note the size of the butterfly as compared with many other insects. Lead them on to describe the colours and markings of such as they may have noticed themselves. Explain that the wings, of which there are two pairs, are covered with minute scales, which have the appearance of very fine dust. Contrast with the transparent wings of the dragon-fly, house-fly, etc. Refer to the six legs—characteristic of all insects—the large eyes, and the feelers, each of which terminates in a round knob. Draw attention to the trunklike mouth, by which food is obtained from the flowers, and compare with that of the bee.

TEACHER'S ILLUSTRATION.

II. The Life of the Butterfly.—(*a*) *The Egg.* Tell the children that butterflies lay their eggs on plants and leaves. Each variety selects its own particular plant which will provide the most suitable food for the grub when hatched.

(*b*) *The Caterpillar.*—Show specimens, and allow the children to describe any they may have seen and the plants on which they were noticed. Gain particulars as to the shape, colour, etc., and call attention to the ringed structure of the body. Point out that there are three pairs of legs on the front portion of the body, while what are known as cushion feet take the place of legs on the rest of the body. Tell how the caterpillar eats voraciously and grows very rapidly, shedding its skin when it becomes too small.

(*c*) *The Chrysalis.*—The different parts of the butterfly, meanwhile, have been forming beneath the skin, and at last the creature fastens itself to some safe place by a silken thread and sheds its last skin. A gummy substance is exuded from the body, which hardens and forms round it a case or shell, in which it lies quiescent for a time.

(*d*) *The Perfect Butterfly.*—Let the children examine a chrysalis, and point out to them that finally the hard, horny case cracks, and the perfect insect emerges to begin its new life as a butterfly.

Association.

Associate with the dragon-fly.

Formulation.

The butterfly undergoes several changes before it reaches its perfect form. In each of these stages it is specially adapted to suit the particular kind of life it has to lead.

Application.

See occupations.

EXPLANATION OF ILLUSTRATIONS.

Teacher's Illustration.—In dealing with the structure of the butterfly, make some such drawings as are shown in the first column. The largest sketch shows the tongue, greatly magnified.

PAINTING.

Painting.—The upper of these butterflies represents the common cabbage variety. The colours are white and black. Paint the body black first with light brush-point touches; the separate parts will be better unjoined. Then draw the outline with the brush, and blacken the edges where shown in the picture,

MODELLING.

and introduce some fine veinings on the white paper. Another butterfly may be painted bright blue with black edges.

Modelling.—To model the chrysalis, first make a slab. Place upon this the model of a branch or stick, made by rolling a piece of clay between the hands. The lower part must be, of course, considerably thicker than the upper part. Then form the chrysalis by moulding with the hands from the object itself.

II.—SKETCH OF A LESSON ON COMMON TREES.

This should, if possible, be taken as an outdoor lesson. Teachers in the town would find it a suitable subject to be dealt with during a visit to a park.

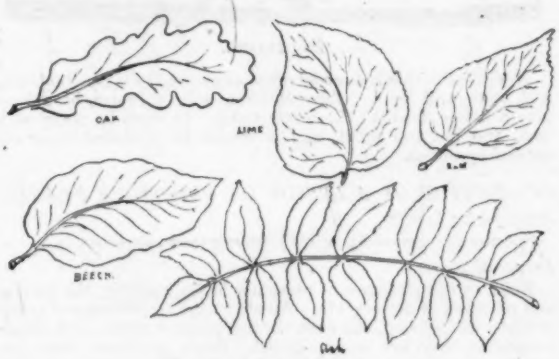
Preparation.

Question to see what the children know of tree-life. Can they name any trees? Can they recognise them when they see them? How can trees be distinguished in summer-time? How in the winter? and so on.

Presentation.

I. The Horse-Chestnut.—Call attention to the general shape and appearance of the tree. Note that the trunk is smooth and round, and that the large leaves consist of seven spoon-shaped leaflets, all springing from the same point on the stalk. The flowers, which bloom in May, are pink and white in colour, and are grouped into erect conical spikes, called by country children "candles." Tell of the very large buds, by which the tree can be easily distinguished in the spring-time, and mention the sticky skin which protects them. Refer to the fruit, which is ripe in October, and describe the "horseshoe" scars which are left when the leaves fall, and which have given the tree its name.

II. The Beech.—Let the class find out that the trunk is smooth and grayish in colour, and that the oval leaves are thin and glossy, with a fringe of very fine hairs. Note the arrangement of the veins, and tell about the flowers, and the prickly beech-nuts which follow in the autumn. Show how the tree is easily recognisable in spring by the long, pointed brown buds. Contrast with those of the horse-chestnut.



TEACHER'S ILLUSTRATION.

III. The Sycamore.—Lead the children to see that the leaves of this tree are somewhat large, five-pointed, and have a long stalk. They are arranged on the branches in pairs, and are covered in the summer with a sticky sap. Refer to the hanging clusters of flowers, which appear in May, and tell of the winged fruit which succeeds in the autumn.

IV. The Willow.—Point out that the willow has purplish-brown branches and long, lance-shaped leaves. Let the children, if possible, describe the catkins when they bloom, the two different varieties ("the golden palms and the silver"), how the flower dust is carried by the bees from one tree to another, etc. Refer to the osier willow, which grows about streams and marshes, and question as to its use.

V. The Ash.—Note that the trunk of this tree is ash-gray. Tell of the flattened ends of the twigs and the black buds, by which the tree can be easily distinguished in the winter-time. The pale-green leaves are cut up into leaflets, which give the ash a graceful and feathery appearance. Contrast the colour with that of the sycamore. Explain that the small purple flowers, which consist of two stamens and a pistil, give place to the winged fruit known to the children as "ash keys."

Association.

Associate the trees discussed with any others known to the children.

Formulation.

A short account given by the children of how they would distinguish the various trees.

Application.

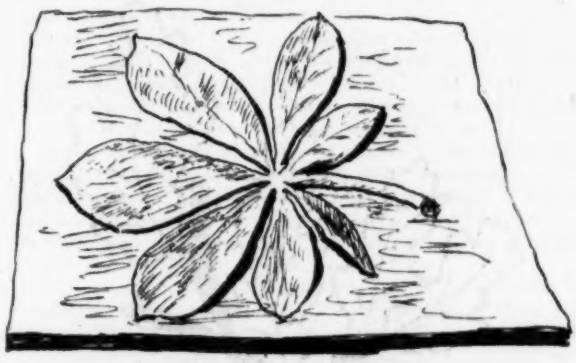
See occupations.

EXPLANATION OF ILLUSTRATIONS.

Teacher's Illustration.—The picture shows drawings of some of our common leaves, and they should all be drawn on the blackboard as they are introduced in the lesson.

PAINTING.

Painting.—This willow leaf is an easy exercise for Standard I. It should be painted from the natural specimen. A rather yellow-green is the colour required. Draw attention to the arrangement of the leaves on the stem. The leaves should be simply washed with about two strokes of the brush, and the veins introduced with the point of the brush when the wash is dry.



MODELLING.

Modelling.—This model is an excellent exercise, but it must not be just cut out. First make the slab, and then carefully mould the leaf in its sections with the hands. There is another method, whereby the leaf is built up by adding small layers of clay gradually, but it is too difficult for children.

III.—SKETCH OF A LESSON ON THE OAK TREE.

Preparation.

The teacher might let the children give any general information they already have on the subject of the lesson, and by questioning gain from them that the oak is much thought of on account of its picturesque appearance, the great age it attains, and the hard wood which is put to so many special uses.

Presentation.

I. General Appearance.—Call the attention of the children to the general structure of the tree. In the case of oaks growing in an open space, the boughs, which are twisted and wavy, grow out from the trunk in a horizontal manner, whereas oak trees growing in plantations have quite a different appearance. Ex-

plain the reason for this, and sketch roughly both types on the board.

II. The Trunk.—Let the children describe the trunk, its thickness, height, strength, etc., and the bark, which is dark and deeply furrowed. Contrast with the smooth bark of the beech. Mention the great hardness of the wood and the uses to which it is put, and contrast with any soft wood which the class may know.

III. The Roots.—Draw a sketch, and show the strong, thick roots. Gain from the class the need for these. Point out that the roots extend as far underground as the branches do above ground, and give the reason.

TEACHER'S ILLUSTRATION.

IV. The Leaves.—Note the general appearance of the foliage. Let the children observe the colour of the leaves, and tell that they are somewhat oval in shape and deeply lobed.

V. The Flowers.—Refer to the catkins of the willow, with which every one is familiar, and point out that the children will find catkins on the oak in May. These contain only the stamens, but there are on the tree other small flowers, surrounded by hard scales and set in between some of the leaves, which contain only pistils. Describe how the wind is instrumental in carrying pollen from one flower to the other.

VI. The Fruit.—Let the class say what the fruit of the oak is called. Show that the scales of the small flowers harden and form the cup of the acorn.

PAINTING.

VII. Creatures dwelling on the Oak.—Mention that the oak provides food and also a home for very many different kinds of creatures. Gain the names of animals which feed on the acorns. Tell of the caterpillars to be found about the leaves, and of the grubs and insects which make a home under the bark. Show an oak-apple, explain how it came to be made, and why, and refer to other galls which may be found, and which have a similar origin.

Association.

Associate with other trees familiar to the children.

Formulation.

The oak is the most valued of our common trees. It may be distinguished by its general appearance of strength, its furrowed bark, twisted, horizontal branches, and by its very characteristic leaves, flowers, and fruit.

Application.

See occupations.

EXPLANATION OF ILLUSTRATIONS.

Teacher's Illustration.—The oak is taken as a typical tree, and the teacher should draw a good picture showing the characteristic branching of it.

Painting.—This may not be so easy as it appears. Children generally find it difficult to get the sinuous edge of the leaf well. Use a light green and vandyke brown for the stem. Paint the latter first; make the buds apparent; then outline the leaves, and wash in quickly with pale green. Let it dry, and then make the veins by simply using the same colour over the wash. This will, of course, appear darker.

MODELLING.

Modelling.—This is a model often attempted in infants' schools, and quite well done. Older children will, of course, be able to give a better finish to the whole thing. It must be made on a slab, and not too small, and it should be modelled from the natural specimen.

IV.—SKETCH OF A LESSON ON POISONOUS PLANTS.

Required for Lesson.

Specimens wherever possible; failing these, sketches.

Preparation.

Refer to the pleasures of rambling in the country, the finding and plucking of flowers, etc. Allude to the carelessness of many children in fingering, and even tasting, parts of plants with whose properties they are unacquainted. Point out that there are certain plants which all children should be able to recognise and be very careful to avoid.

Presentation.

I. The Foxglove.—Show the plant if possible, also sketches, and let the children note the size, the thick, downy leaves resembling those of the primrose, and the large, bell-shaped, reddish-purple flowers. The inside of the flower is speckled with differently-coloured spots. Explain the use of this, and also of the tuft of hairs which guards the inside of the tube. Tell of the poison extracted from the plant, which is of great use in certain diseases, and warn the children against putting any part of the foxglove into their mouths.

II. The Hemlock.—This plant, which is seen in flower in June, is found on all kinds of waste land. Let the class note the fern-like leaves, the tiny white flowers—all grouped into a cluster (umbel)—and the smooth stem, which is spotted with purple.

III. The Yew.—The yew is not a wild plant, but may be noticed by the children in gardens, along hedges, and in churchyards. Let the class observe the very dark-green, needle-like leaves. Tell of the tiny white flower, and caution against eating the beautiful scarlet berry.

IV. The Laburnum.—This tree, with its drooping bunches of golden flowers, always proves tempting to little ones. Compare the shape and colour of the flowers with those of the broom. Note also that the fruits of these two plants are similar, and tell of instances in which children have been poisoned by mistaking the seeds for little peas.

V. The Arum.—The children will be able to tell this plant by the arrow-shaped leaves, spotted with purple; by the greenish wrapper, resembling a leaf, which covers the tiny flowers; and by the purple club which makes the plant so conspicuous. Refer to the peculiar use of this last, and tell of the pale scarlet berries, which must be avoided by the children.

VI. The Deadly Nightshade.—This is a plant with large, dark-green, egg-shaped leaves and purple flowers shaped like a bell. The berries when ripe are black and shiny, and have often been eaten in mistake for black cherries. Note that it is useful as a medicine, but should not be even handled by children.

Association.

The children might compare the poisonous plants, their leaves, flowers, and fruit, with any plants or parts of plants they know which are in any way similar.

Formulation.

Certain plants which have attractive-looking flowers and berries are highly poisonous, and should be carefully avoided. Some of the poisons contained in these plants, however, are, when rightly used, valuable medicines which we could not well do without.

Application.

See occupations.

EXPLANATION OF ILLUSTRATIONS.

Teacher's Illustration.—In this picture are shown some specimens of poisonous plants which grow about a river—the arum, water-hemlock, laburnum, foxglove.

TEACHER'S ILLUSTRATION.

Painting.—The colours required for painting the foxglove are green and red; the latter must be of rather a pink tinge. Paint the stem and flowers first. You must enlarge it from the size here given. Show some of the fruit formation at the lower end, where the flowers have fallen away; then paint the leaves.

The arum is a subject often attempted, and it is very effective as well as easy. It only requires one colour (green), and for this reason it is exceedingly well adapted for doing with a large class.

Modelling.—There will be a considerable amount of work in this. The leaf on a branch is in itself a pretty model. Make a slab first, then the main stem and leaf, and model the pods one by one. Be careful with the calyx at the top, and join neatly to the stem.

MODELLING.

NATURE STUDY IN LONDON SCHOOLS.

ONE of the most striking developments in the elementary schools in recent years has been the improved teaching and increased use made of nature study, especially in the infants' and to a less extent in the senior department. The old disconnected scheme of object lessons has now practically disappeared, and in place of this we have a rational scheme of nature work, which, from its infinite possibilities in variety of treatment and the ease with which it may be correlated with other subjects of the curriculum, has a unique value.

In addition to the supply of specimens under the botany scheme, which is admirably managed, other sources of material are now provided through the development of what is known as the mutual aid scheme, in which town and country schools are brought into intimate connection, primarily for the interchange of material for use in the schools.

The great interest taken in the teaching of nature study is evidenced by the rapid growth of the organisation known as the Nature Study Union, through which ample facilities are given to teachers of hearing lectures by well-known authorities, and of discussing subjects of interest in nature-study teaching. Excellent opportunities are also given in the interesting series of Saturday excursions under skilled guidance of acquiring a love of field work and of learning to appreciate the enormous value of nature lessons under the most favourable conditions.

The Nature Study Union has already a membership of more than six hundred members, the majority of whom are teachers in the Council's schools. The nature study excursion is now becoming a permanent feature in many schools, and in some, notably Bellenden Road, annual excursions extending over a week or ten days during the holidays are regular institutions.

The nature study work reacts beneficially on the school museum, and makes it a very valuable reference library. The collection of objects at Bellenden Road (boys), distributed among several classrooms, is a model of what a school collection should be. School gardens are on the increase, and play a useful part in the nature study course.

THE NEW ENGLISH MOVEMENT IN L.C.C. SCHOOLS.

MR. BLAIR'S report of the work done in London County Council Schools during the past year makes pleasant and stimulative reading for all concerned in the improvement of school method. We give below a specially interesting extract, which ought to be carefully studied by teachers in all parts of the Empire.

The Teaching of Literature.

Mr. Bray, L.C.C. Inspector, writes:—"There is a decided upward tendency in the teaching of English Literature, and generally a more liberal view is being taken of the possibilities of the subject.

"Improvement is seen in the choice of material and skill in handling it; more time has been devoted to silent reading; and the school library has been more extensively and systematically brought into use. But only a few schools in each district stand out prominently in these respects, and even in them the claims of literary study are mostly confined to the two upper classes, though the continuous reader is more or less found in the other classes of the school.

Typical Courses of Study.

"Some typical courses of study, expressed in generalised form, are indicated below. These apply only to schools in which exceptional attention is given to the subject:—

"1. A study of the works of a poet every year, commencing with Standard V. or VI. Longfellow, Tennyson, Wordsworth, and others are thus taken, the lines to be memorised being selected from the poems under study for the year. The extracts are sometimes very numerous, and far in excess of the demands of the Code.

"2. Studies in which Shakespeare is specialised. Great enterprise is displayed in attempting to give realism to the subject. Shakespeare flowers are grown; the pupils become the characters—with costumes, if possible; visits are paid to places of historic interest associated with the life of the poet or his characters. Stress is laid on Shakespearean songs. Visits to the theatre are made when the play under study is being performed by a good company. Two schools took a party to Stratford-on-Avon during the last school year.

"3. Studies in which the works of one poet, like Tennyson, are taken for two years in succession, followed by the last year's course devoted to Shakespeare.

"4. Studies in which literature is taken generally as a substitute for formal grammar.

"Most of the above studies are supplemented to some extent by prose works in the form of continuous readers. This breadth of treatment gradually narrows down from the best to the poorest schools until a vanishing point is almost reached.

"Generally the higher elementary and the higher grade schools, especially the former, have a satisfactory course of literary study. One girls' school in particular has a very attractive and ambitious scheme, the subject being treated to some extent historically. During the four years' course most of the chief classics come in for partial study, and a very large number of literary gems are committed to memory.

National Home-Reading Union.

"It has been the practice of the late authority and the Council to encourage the formation of reading circles in connection with the National Home-Reading Union. The Council pays the annual subscriptions to the Union, and supplies a copy of not more than two books for the use of each child in the class. These books the children are allowed to take home, and with the object of encouraging the children to possess their own books, the Council has decided to supply them at half the published prices.

"During the year, 196 of these circles were in operation in the Council and non-provided schools. This in itself is an indication of an advance in literary enterprise, 196 being the largest number of reading circles ever formed in London in this connection. There are signs of a considerable increase in the number of reading circles during the current year.

"Power in composition has increased because the teaching in literature is wider and better.

Time devoted to Literature.

"There is no doubt, however, that in the great majority of the schools insufficient time is given to literature. The range—where a range can be found—is narrow, and the instruction inadequate. Something can be done almost immediately to improve the instruction and extend the time devoted to this subject. Teachers need guidance in this matter; they are, as a rule, very willing to fall in with suggestions. It would be well therefore if complete and connected courses of study could be drawn up to suit almost any type of school, leaving the teachers free to make their own selections from these courses. The English Conference * now sitting will make suggestions in this direction.

Children's Selections.

"In a school here and there scholars are encouraged to make booklets containing their own little essays, favourite poems, and other quotations from the work under study, the whole being illustrated by black-and-white and coloured pictures culled from the magazines and other available sources.† Thus there are Shakespeare booklets, Longfellow booklets, etc., which will probably prove a lifelong possession to the scholars who made them, and may prove a nucleus around which other literary possessions will be gathered. The making of such booklets must be productive of good; and if the making is not regarded as an end in itself, better results must follow.

Public Libraries.

"Teachers are now fairly generally encouraging their scholars to make use of the public library, the librarians, as a rule, showing a constant desire to co-operate with the school for this purpose. The scholars are thus directed in the choice of suitable books. The Library Conference has already done much to foster this co-operative spirit and to strengthen the connection between the school and the municipal library.

Need of a Connected Scheme.

"When literature is skilfully and earnestly taught,

* A Committee appointed by the L.C.C. some time ago, which is to report during the present month.

† Teachers wishing to take this hint are recommended to use the picture post card. See the *Practical Teacher* for last month.

its appealing power to the child is very great indeed, and it becomes the favourite subject. But if any far-reaching results are to accrue from the study of literature, development must proceed steadily upward from the infants' school, where the foundation of literary feeling should be laid. Fortunately many infants' schools are doing this now. Haselrigge Road, Invicta Road, and Oldfield Road are good examples. The half-expressed demand of the past that the infants' school should mirror the methods of the senior departments is gradually being abandoned. There is now a growing feeling, gathering in strength daily, that the senior departments should instead continue the methods and aims of the infants' school. That this is the right line of development will be accepted by most teachers in the near future.

"Oral composition, story-telling, the application of the principle 'things before words' and 'words through things,' the half-conscious realisation of the music of the mother tongue, are enabling language to keep more equal pace with thought, and giving a fuller and richer content to young children's words."

THE SUGGESTIONS ON RURAL EDUCATION.

THE recent issue of *Suggestions on Rural Education* should prove highly interesting reading to those who are concerned in the future of the village school. It is now seven years since the Board of Education first gave full liberty to adapt the rural curriculum to local needs, and these seven years have not been fraught with undue haste. Reform in all things is essentially slow, and in matters of education particularly desirable, yet in rural education it is necessarily difficult. It would seem that the policy of our rural education has not been too clearly defined; we have not progressed far beyond the discussion of its objects. Is it that we are still susceptible to external influences such as those of the Continental systems or those of the United States? Do we confuse the issue of the rural school with the complex mass of causes that constitute rural unrest? or are we attempting to establish an unreal thing? It is clear, on the face of things, that the basis of rural education needs broadening, and these *Suggestions* will go far to achieve this object.

The frequent allusions to agricultural teaching in discussions relative to rural economics would lead one to suppose that its inclusion in the rural curriculum would stem the steadily increasing flow of humanity citywards. This gross misconception has led to a distorted view of the objects of the village school. We do not need training schools for the supply of agricultural needs; we require a really practical educational system that shall ensure the complete equipment of the rural child. In this respect it is pleasing to read "that the natural increase in the population usually necessitates a steady migration of young men and women from the country to the town, and education must be of such a kind as not to place these at a disadvantage." Again, in the section dealing with the need of a rural basis in the education of the country child, "while it is not desirable to give didactic instruction in agriculture or other rural industry to children in elementary schools.....partly because there are likely to be children in the schools who will afterwards migrate to the towns, and to whom, therefore, such teaching would be waste of time, it is desirable that the influence of country surroundings should be distinctly felt in the curriculum."

This adaptation of rural education to the environment of the school is the central idea of the *Suggestions*, and it is as welcome as it is excellent. Yet how far the fundamentals of the courses are adaptable to the majority of the schools of our rural areas is a problem. There are difficulties and obstacles of long standing, and these cannot be removed by a few strokes of the pen. Thus in connection with the development of the manual subjects there arises the all-important question of accommodation; and "in view of the importance of manual work, it is unfortunate that so few rural schools are provided with suitable indoor accommodation, or even with a plot of land for gardening. It is urgently to be desired that all new rural schools should be planned with a view to providing a room, preferably opening out of the classroom, so as to be under supervision, suitable for woodwork, cooking, etc., and that ground should be secured, over and above that needed for the playground, suitable for gardening."

This matter of accommodation constitutes a serious question, and comparatively few really rural schools possess the facilities afforded by modern architecture. Thus the avowedly important advantages of manual subjects can only be realised, to any appreciable extent, by very few schools. The provision of a gardening plot is a much less serious question. Further, the incorporation of manual subjects affects the organisation in such a way that revision of the staffing regulations is absolutely essential. What of the single-handed schools? The schemes of suggested courses are good, and are of real educational merit, yet some amount of reform must take place in the machinery of the village school before the full value of these courses can be realised.

One good result of these *Suggestions* should be a clearer definition of the aims and methods of nature study, concerning which there has been much misunderstanding. This misapprehension of so important a subject, which is pre-eminently the integral part of rural education, has been due in most instances to the spasmodic and extravagant renderings of misled enthusiasts. There are also propagandists who have brought the teaching of nature into unwholesome ridicule through "a superstition which worships the symbols of knowledge instead of knowledge itself." Hitherto it has not been too widely appreciated that nature study is not a subject of instruction, but a method of treatment. Much has been paraded under the title of nature study that might well be described in less dignified terms, but the schemes and courses given in the *Suggestions* should do much to give us sound educational procedure in this respect. The limitations of the subject are emphasised, and consideration of those matters that alone afford educational aids is entertained. The value of judicious correlation of subjects deservedly receives importance. "A proper correlation of subjects saves time. Nature study, arithmetic, and woodwork involve freehand, geometrical or scale drawing, and far beyond what is thus required the teaching of drawing need not go." "Gardening is practical nature study.....Geography in its early stages is also nature study; writing and composition are essential to it. Even arithmetic frequently touches it."

(*To be continued.*)

THE CULTIVATION OF THE TIME-SENSE.

WE have recently had the pleasure of examining a series of time-charts (issued by the Stead Publishing Company), designed for use in history teaching, which appeared to us likely to prove exceedingly useful. An examination of the section given below will show the method adopted in the preparation of these charts, but we ought to add that the efficacy of the device is increased by the use of colour, the horizontal sections being distinguished by various tints. The value of the method adopted in the preparation of these "history maps" will be immediately evident to all teachers of history who agree with the writer of the *Scottish Memorandum* that "time relations should receive a vivid and enduring representation in space," and that what is required is "a chart or continuous band, divided to represent centuries or half-centuries."

A specially interesting and valuable feature of this time-chart is the way in which contemporaneous events are mapped out. Here we see that while the barons were "fighting for the Crown" in the Wars of the Roses, Malory's "Morte d'Arthur" was published—a much more important event; that Vasco da Gama was doubling the Cape while Perkin Warbeck was making his attempt to seize the crown of England; and so on.

We commend these history maps to all our readers, teachers and students alike. None of us are exempt from haziness in this important matter of chronology, and such aids as these are sorely needed. "My wife is an excellent woman," said Lord Beaconsfield on one occasion, "but she can never tell who came first, the Greeks or the Romans."

OUTLINE HISTORY MAP—SECOND HALF OF FIFTEENTH CENTURY.

	1450	1460	1470	1480	1490	1500
Dynasty	HOUSE OF LANCASTER.		(1) | HOUSE	OF YORK	(5) | HOUSE	OF TUDOR (1603)
Sovereign	HENRY VI. (1)		ED	WARD IV. (3)	EDW. V. (2) RICHARD III. (2) | HEN	RY VII. (1509)
Minister			The Nevilles (1) (4) | Warwick the (1) King-maker		Gloucester | M	ORTON
Political and Constitutional	Decline of Parlia		ment Rise of	the New	Monarchy—	Tudor Period
	4 York Protector		Benevolences raised Dispensing power	exercised	3 Gloucester King Richard III. 6 Henry marries Elizabeth of York 6 Star Chamber	
Home Affairs—		(5)	Wars of	the Roses	(5)	
(1) **England**	5 Battle of St. Albans		1 Mortimer's Cross	1 Barnet	3 Murder of the Princes 5 Bosworth	(1) Perkin (9) Warbeck
(2) **Scotland**	James II. (10)		James	Third	(8) | James	IV. [1513
	10 King killed at Roxburgh Castle		5 Rise of the House of Arran 9 Orkney & Shetland Marriage Dowry of Qn.		2 Lander Bridge 8 Sauchieburn 8 Death of King	4 Aberdeen University founded
(3) **Ireland**	10 Civil War Geraldines (York) Butlers (Lancaster)					4 Poynings's Law
European	Frederick		Third	Emp	eror	(3) |
	Charles VII. (France) 100 Years' War (3) 1 All English possessions lost except Calais		(1) | Louis Elev	enth of France dalism in Fra 1 War between Venetians and Turks	(3) | Charles Change from Modern	VIII. (8) Mediæval to Europe
Foreign	3 Capture of Constantinople by the Turks		Fall of Feu			4 French enter Italy 1 Granada taken Moorish Dominion ends
				10 Castile and Aragon united		
Literature			10 Malory's "Morte d'Arthur"	4 First English Book printed (at Bruges) 7 First Book printed in England		
Discovery	Invention of Art of		Printing and Era 8 The First Printed Calendar	of Geogra William 6 Art of Printing introduced to England by Caxton	phical Dis Caxton 6 Bartholomew Diaz doubles the Cape	covery 2 Columbus discovers W. Indies 7 The Cabots discover Mainland of America 7 Vasco da Gama doubles the Cape
	1450	1460	1470	1480	1490	1500

NOTE.—The dates between any two decades are read downwards—for example, Murder of the Princes, $\frac{1480}{3} = 1483$.

Where an event is extended into another decade, as, for example, $\frac{(5)}{1450}$ Wars of the Roses $\frac{(5)}{1480}$, read 1455–1485.

The figures preceding and following the names of authors and inventors indicate *the period when they flourished*.

Our Prize Competitions.

RULES.

1. All French translations **must be received not later than June 8, 1906,** and addressed to:—PRIZE EDITOR, Office of *The Practical Teacher*, 35 and 36 Paternoster Row, London, E.C.
2. Competitors should cut out and send the *coupon* which appears on the Back Wrapper page of the current number. One coupon must be sent for each entry.
3. Competitors in No. I. should write pseudonym only on MS. Prize-winner will be asked to send name and address for publication.
4. No competitor may take the prize offered more than once in three months.

I.—FRENCH TRANSLATION COMPETITION.

A Prize of **Half a Guinea** is offered for the best rendering into English of the following extract:—

Nous demeurons impassibles, et, mettant chapeau bas, nous nous accoudons à la balustrade de la piscine. Il y a tout au plus deux cents personnes autour de l'autel. Le gros de l'assemblée se compose de femmes et d'enfants; une vingtaine de prêtres et de séminaristes en vacances sont agenouillés çà et là, et leurs soutanes jettent des notes noires au milieu des robes voyantes des femmes. La matinée est fraîche, et une dévote a apporté une chaufferette sur laquelle ses pieds sont pieusement posés; deux dames plus frileuses encore sont restées dans leur voiture et lisent leur paroissien en se serrant l'une contre l'autre sur les coussins. Le jeune abbé, frisé et content de lui, que nous avons remarqué sur la route, se tient près du marchepied avec son élève. C'est un beau brin d'abbé, brun, bien découplé, au menton rasé de frais et bleuâtre, aux façons précieuses et apprêtées; ses gros yeux noirs semblent pleins d'admiration pour sa propre personne, et ses lèvres rouges ont l'air de se murmurer à elles-mêmes des compliments. Cependant on a lu l'Evangile, et un certain remueménage annonce qu'il va se passer quelque chose d'important. En effet, deux prêtres escortent jusqu'à l'estrade de l'autel un évêque à cheveux gris, à la tête bienveillante et fine, qui bénit l'assemblée et commence en style fleuri le panégyrique de Saint Rouin. L'eau du réservoir chatoie, les chandeliers d'argent jettent des éclairs, les chasubles des chantres, les calottes rouges des enfants de chœur, les toilettes bariolées des dévotes s'épanouissent dans la verdure comme des fleurs dans un pré, et le prélat lui-même, avec sa robe et son camail de cérémonie, ressemble à un magnifique iris violet.

From "Sous Bois," by ANDRÉ THEURIET.

RESULT OF THE MAY COMPETITION.

The prize is awarded to "Minna Troil." (Will "Minna Troil" kindly forward name and address for publication?)

First Class.—Scotia (A), Yorick, Haron, Æneas, Harmony, Moira, Kinlochlaich, St. Cuthbert, Lévrier, Paul, Episcopus, A reader, Jouenri, Thiais, Voe, Edith, Max, Pax, Jersey, Scixio, Lik, Merry England, North, M. E. T., Ali Thaleb, Baloo, Dolorès, Chessar, Anne, Esperant, Wer, Marie, Jude, Ginger, Comet, Missy Miskin, Graziella, Lev, C. B. A., Imp, Alberta, Welsh girl, T. V. D., Winnowsty, Killarney, Gabriel, Pressure, Ella, Cæreinion, St. Dié, Mavis, Angèle, Esme, Cumine, Eurydice, W. J. S., Faragon, Puero, Douglas, Syd, Jostedalsbrae, L, Rose.

Second Class.—Scotia (B), P. J. D., Meigle, Pierre, Craig, Rossie, Dernier, Le chêne, Tralee, Elsie, Rosalind, Sag, Herta, Warboro, May (A), Robbie Burns, Bobby, May (B), Giovanni, Lector, Colunio.

The name and address of "Alder," the winner of last month's competition, are: Miss E. Holdsworth, 31 Rochdale Road, Halifax.

REPORT.

The average of this month's papers is rather high. Some competitors who have not yet grasped one of the primary canons of translation insisted on translating the French future into the English future wherever it occurred. The same class of students also translated *Mon Dieu* and *il faut dire* quite literally into English. Some students did not grasp the meaning of the repeated *et* in *et par son amour*, etc., and failed to see that each of the phrases introduced by *et* is dependent on *respectable*. A larger number failed also to see that *impertinence* must not be translated by the English word of like spelling. It means irrelevancy, absurdity, nonsense, or, as the successful competitor puts it, "pointless remarks." "Missy Miskin" sent in two papers. We do not see the object of this, and request that no competitor will do it in future. We wish competitors would not choose the more obvious pseudonyms. Singularly, we have a "Scotia" at the head of each of the two classes. Scotia (B)'s exercise is written on foolscap, and Scotia (A)'s on paper of a smaller size.

By a printer's error "Malin" appeared as "Matin," but no one has been prejudiced by the difficulty thus created.

PRIZE TRANSLATION.

Do you wish to make good men and women of your children?

Be their father only, and not their judge and tyrant. And what meaning do I attach to "being their father"? I mean to convince them that you love them. That conviction originates in your winning for yourself their whole-hearted love.

We invariably love those by whom we feel certain that we are loved; and when your children love you—when they look upon the authority which you exercise over them, not as an odious prerogative bestowed on you by law, of which you are proudly jealous, but as the result of a solicitous tenderness which desires their welfare, which seems to proffer as a request what it really advances as a command, which is more desirous of winning over than of conquering, which suffers in using compulsion, far from taking a malicious pleasure in it, as often happens—oh, from that time you will be the father of your children. They will fear you, not as a hard taskmaster, but as a friend to be respected, both on account of the love he bears them, and on account of the interest which he manifests in them. No longer will it be your authority that they will shrink from offending: it will be your heart which they will be unwilling to wound; and you will see then how easily reason will enter their minds, aided by this tender feeling for yourself which you will have inspired in them.

I once saw two little children, both of them about seven or eight years old, who to my eyes seemed very pretty machines. I call them "machines," because they had been brought up only to repeat some phrases, such as "Your servant," "You do me great honour," etc.—expressions for which I did not greatly care.

Ah! forsooth, if children are to give no answer but pointless remarks, let us allow them to have their own thoughts. What good do they derive from these words which they repeat parrot-fashion? Let us listen to their pointless remarks, and tell them afterwards, "That's not what you ought to say." Nothing makes the mind more sluggish than this supply of small talk which is provided for them, and which they expect.

II.—NATURE STUDY COMPETITION.

The Prize Editor regrets the comparatively small number of entries for this interesting competition, as he knows of a large number of schools where continuous observation of natural phenomena and development in leaf, bud, and flower is carried on in a very interesting and intelligent manner.

However, the papers sent in show, on the whole, a carefulness of observation which denotes conscientious teaching on right lines. Two papers share the honours, one being slightly superior to the other. Our award is as follows:—

A Prize of *Six Shillings and Sixpence* to HILDA LAMING, aged 13 years, of St. Denys Girls' Council School, Southampton—Headmistress, Miss S. H. Blackman.

A Prize of *Four Shillings* to ELSIE H. COLLIER, aged 11 years, of St. Julian's School, Shoscombe, Bath—Headmaster, Mr. Edgar J. Pound.

HILDA LAMING, GIRLS' COUNCIL SCHOOL, ST. DENYS, SOUTHAMPTON.

The paper done by Hilda Laming shows patient observation of the horse-chestnut on each consecutive day during the month of April, and is furnished with capital pen-and-ink sketches showing development of flower and leaf.

Elsie Collier's work consists of observation of the ash tree. On April 22 she reports, "Some trees are not as forward as others." We wonder if our little friend can find some reason why.

Of the other papers sent in we wish to commend those of—

Reginald Albert Stokes, 12 years, St. Paul's School (town not stated)—Headmaster, Mr. W. P. Swindells. Subject: "The Life of a Frog."

Percy L. Collier, aged 12. Subject: "Weather."

Winnie Stock, aged 11. Subject: "The Lilac Twig."

Gladys Newsome, aged 11. Subject: "The Oak Tree."

(The above three all come from St. Julian's School, Shoscombe, Bath—Headmaster, Mr. Edgar J. Pound.)

Marie C. C. Horrax, aged 12, Notre Dame Secondary School, Sheffield. Subject: "Spring Blossoms."

Doris Genevieve Rowley, aged 14, Holy Trinity Girls' School, Wimbledon. Subject: "Spring Flowers."

Harold Walmsley, aged 11, Sulyard Street School, Lancaster—Headmaster, Mr. T. S. Hird. Subject: "The Chestnut."

SAMUEL CHAMPLAIN, THE FOUNDER OF QUEBEC.

PART I.

BY E. M. WILMOT-BUXTON, WISTONS SCHOOL, BRIGHTON.

[This and the following paper are intended for those of our readers who wish to draw the attention of their pupils to the historical aspect of the Canadian tercentenary celebrations to be held in July; also for student teachers who may expect questions on Canadian history in examinations of the present year.]

THREE hundred years ago, on July 3, 1608, a lonely ship sailed up the St. Lawrence. The white whales floundering in the Bay of Tadoussac, the wild duck diving as the foaming prow drew near—there were no signs of life but these in all that watery solitude, twenty miles from shore to shore. The ship was from Honfleur, and was commanded by Samuel de Champlain, who was destined to call into existence the colony of Canada.

Samuel de Champlain, "sailor, soldier, and gentleman adventurer," then forty-one years of age, had already won a name for himself both in fighting under the banner of Henry of Navarre and as a discoverer.

Five years before this time he had explored the River St. Lawrence as far as the rapids above the future site of Montreal, and his experience had proved that below, at Quebec, was an excellent position for a colony. The rock of Quebec stood at the gateway to a great water passage which might prove to be the highroad to China and Japan! It would be a centre for the fur trade of the interior, and its commanding position would preserve it from foreign intrusion. Here also it would be possible to come into close touch with the Indian population, whose conversion to Christianity was always the nearest object to Champlain's heart.

On July 3 he landed below the Heights of Cape Diamond, where the current of the St. Lawrence is "strangled to a breadth of scarcely one mile;" and on the shore between the water and the cliffs his axemen set to work. True pioneers they were of an advancing host, for with them began the founding of Canada.

Here, on the site of the present market-place of the Lower Town of Quebec, rose a pile of wooden buildings—his "habitation," of which he gives us a rough sketch in his diary—surrounded by a strong wooden wall and flanked by the beginnings of a garden. There Champlain was at work one day, when his pilot approached him with troubled face and the news that a plot was afoot to kill the leader and give up Quebec to the neighbouring colony of Basques at Tadoussac. The four ringleaders had frightened the rest into consenting to strangle or shoot Champlain, and had promised that their fortunes should be made. On hearing this, Champlain calmly told the man to order a small ship that had lately arrived to anchor near the shore. On board was a youth who knew nothing of the conspiracy, and he was ordered to invite the four ringleaders to share with him two bottles of wine which the leader sent to him. This they did, and walked gaily into the trap that Champlain had thus prepared. "Here were my fine fellows nicely astonished," he records in his diary, and proceeds to tell how one was hung as a warning to the rest, the other three sent back to France, while a free pardon was given to the rest of the terrified company when they pleaded for mercy.

This was the first and last attempt at mutiny, for Champlain had the art of managing men, and it was a loyal crew that settled down to face the first hard winter at Quebec.

He soon found that he was regarded as the natural protector of a large band of Montagnais Indians, whom the cold had driven down to the coast. These built their cabins near the settlement, and passed their time in alternate gorging and sleeping. Very often they were roused from the latter pastime by wild nightmares of scalpings at the hands of their dreaded enemies the Iroquois, and would flee to the French fort for protection from their imaginary foes. Famine, too, drove other tribes to the settlement, and thus friendly relations were soon established. But before the winter passed twenty of the little French band had died from scurvy, and the eight survivors were looking longingly for help from France.

This came in June, and set Champlain free to enter upon his long-planned expedition up the river. To this the great obstacle was the formidable race of the

Iroquois, the terror of the other Indian tribes. But the chief of one of these latter, much impressed by what he had seen of Champlain at Quebec, approached

CHAMPLAIN'S HABITATION.
(From the "Story of Canada." By kind permission of Mr. Fisher Unwin.)

him with the request that he would join them in fighting against these deadly foes. This he gladly promised, hoping thus to win his way to regions which would be otherwise closed to him.

The "man with the steel breast" soon became a kind of divinity to his Indian allies. After he had shown them the wonders of Quebec, they treated him to a war-dance, in which "the fierce red firelight fell on tawny limbs convulsed with frenzied gestures and ferocious stampings; on contorted visages hideous with paint; on brandished weapons, stone war-clubs, stone hatchets, and stone-pointed lances, while the drum kept up its hollow boom and the air was split with mingled yells."

After this exhibition Champlain embarked in a small boat, escorted by hundreds of canoes, and proceeded up the River St. John. Presently a great quarrel arose among the red men, and three-quarters of their number returned in high dudgeon. Champlain himself, finding it impossible to sail his boat through the rapids, sent it home, and with two companions put himself entirely into the hands of the Indians. These carried their light canoes by hand till they came to a smoother current, and then proceeded, till at length the pioneer found himself upon the waters of the lake that bears his name.

The borders of this lake were infested by Iroquois, and their advance had now to be made by night and with the utmost caution. Their aim was to land at the farther end of the lake, the future site of Fort William Henry, and from thence to carry their canoes through the forest to the Hudson River, thus establishing a line of connection with the New England coasts. But before they had quite reached the point of Ticonderoga they saw, one night about ten o'clock, a dark mass moving before them on the lake, which proved to be a fleet of Iroquois canoes.

Directly the latter perceived them they landed and began to make an ambuscade, while Champlain's allies tied their canoes together and executed a war-dance, accompanied by yells of a piercing character, intermingled with a "commerce of abuse, sarcasm, and boasting." At dawn they landed, and as they went up the shore saw two hundred of the Iroquois, the boldest and fiercest warriors of North America, advancing upon them. At this the allies drew back, and opening their ranks summoned Champlain to the front. At the warlike apparition in full armour the Iroquois stared astonished. "I looked at them," says Champlain, "and they looked at me."

Then he fired, and brought down three chiefs almost at once. "As I was reloading," he goes on, "one of my companions fired a shot from the woods, which so increased their astonishment that, seeing their chiefs dead, they fled into the depths of the forest," where the allies pursued them, taking many prisoners.

This victory made an immense impression upon the allies, who, when they returned home, gave Champlain a warm invitation to visit and aid them again. This was the beginning of a long conflict, inevitable, perhaps, but destined to keep the new-born colony in a state of unrest both at that time and in future years. "Champlain had invaded the tiger's den, and now, in smothered fury, the patient savage would lie biding his day of blood."

After a while Champlain returned to France in the hope of getting fresh support. But the cramping despotism of the mother-country merely hampered the growing colony by its policy of keeping it dependent upon her, even for its food supply. It was this neglect of the interests of her colonies that led ultimately to their loss, and which caused the heroic efforts of these early pioneers to be largely wasted. For the present, however, Champlain was content with permission to explore, and in 1610 we find him once more at the mouth of the River St. John, aiding the Montagnais tribes against the Iroquois in a desperate conflict which won him further renown as a leader of men.

(To be continued.)

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A HELPFUL TEACHERS' BOOK.*

MANY of our readers are anxious to meet the new requirements in the teaching of English, feeling as they do that the reformers are perfectly sound in their demand for greater attention to the mother-tongue in our schools. But while it is easy to agree with the promoters of the New English Movement in a general way, it is not so easy to carry out their ideas, as expressed on the platform and in the press, within the walls of the classroom. We therefore accord a very hearty welcome to an illuminating, stimulative, and practical handbook lately issued by Messrs. Blackie and Sons, entitled *The Teaching of English*, which avoids truisms and platitudes, and endeavours to show how to set about the difficult task which we all feel has been neglected for so long.

The authors of this volume are contributors of our own, and their opinions are based, for the most part, upon actual teaching experience. They confine themselves almost entirely to the teaching of literature and composition, and they deal with these two branches of the subject at each stage of the ordinary school course. Teachers of all grades will therefore find help and guidance of a very practical character within the pages of this book, for the authors begin the definite teaching of literature and composition in the infants' class, which is good pedagogy as well as good sense.

Emphasis is rightly laid upon the value of story-telling in laying the foundation of a taste for good literature. There is no more important part of the work of the infants' teacher, and each candidate for a certificate ought to be very carefully tested as to her power of telling a story. But in choosing suitable material for story-telling, great care ought to be taken to make the tale suit the young child's limited experience. It is easy enough to make a collection of tales from all available sources, but we have not yet seen—not even in the excellent second chapter of this book—any definite graduation of the material which appears to us to satisfy the requirements.

It is a mistake to introduce a beautiful story too early in the school course, for then it must be shorn of much of its beauty in order to bring it within the limited comprehension of young children. For example, we do not think that Hawthorne's "Golden Touch" and the stories of Orpheus and Atalanta form the best possible material for oral narration to children of three to five years of age. This is a matter which would bear discussion, and we hope to return to it in an early number of the *Practical Teacher*. We have formed a vicious habit of thinking that everything within the covers of a book labelled "Fairy Tales" must be relegated to a very tender age; but there are stories in the works of Hans Andersen—to take only one example—which ought not to be used in school until a fairly advanced age has been reached.

Our authors deal next with "Literature in the Upper School," and among the many excellent suggestions in this part of the book we have the following:—

"*The English Room.*—Where it is possible to make the necessary arrangements, it will be found a very helpful plan to have a special room for English. There is perhaps little necessity to say how such a room should be furnished; that must be left to the individual taste. Pictures of the English authors and of the country in which they wrote, their busts and their books, will of course be used. A room tastefully decorated with such literary adornments cannot but create an environment likely to lift the pupil out of his everyday surroundings to a higher plane of thought in harmony with his literary studies."

Every one of our readers will find something helpful and interesting in the chapter which is entitled "Some Notes on the Method of Handling Lessons." We cannot do justice to its suggestiveness in the space at our disposal. It gives exactly the kind of help that teachers are asking for—detailed, practical, the product of experience. The chapter immediately following, on "Classical Literature through English Translations," was originally printed in our own pages. The remarks on correlation are distinguished by restraint and illustrated by a suggested course of lessons on a correlated plan, in which all our readers will be deeply interested. The repetition lesson is next dealt with, also in a practical manner. We commend this suggestion:—

"The best of the pieces learnt by heart should be set down in a thick notebook, strong enough to last a lifetime. What is worth learning is worth keeping. The book itself will be a source of great pleasure in after-life."

We should like to add the further suggestion that the book might be illustrated by the employment of picture post cards. Such a volume ought to contain poems which cannot be included in the ordinary school anthology owing to the operation of the Copyright Acts. We have never been able to understand why selections from the best poetry of to-day should not at once be employed in the literature lesson in school and college.

Composition, prose and verse, and paraphrasing are adequately treated, and most of our readers will find these sections also full of help for every day. There are also sensible remarks on the school library—the subject needs fuller treatment, however, especially the matter of graduation—the school dramatic club, the school magazine, the literary society, and the debating club. The whole book is alive, and will help forward the New English Movement in a manner of which its authors may well be proud. To all our readers of every grade of the profession our advice is—Buy the volume, use it daily, and do not allow any one to borrow it.

* *The Teaching of English.* By A. E. Roberts, M.A., and Amy Barter, L.L.A. Blackie and Son.

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ONLY a writer and thinker of transparent honesty of purpose could revive with profit, in our somewhat cynical age, the perennial theme which treats of the nature and conditions of happiness; yet M. Paul Souriau attempts the task of determining "scientifiquement, suivant les méthodes modernes, les conditions réelles du bonheur," * and performs it with a precision and distinction which will make direct appeal to all tolerant, open-minded thinkers, and especially to our readers north of the Border, who are famous for "thrashing it out." His book is distinguished by that engaging

* *Les Conditions du Bonheur*, par P. Souriau, Professeur à l'Université de Nancy. Libraire Armand Colin. 3 fr. 50.

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method and order which are characteristically French, and which mark extreme clarity of thought; and it commands respect at least for its conclusions, to which the reader is almost unconsciously led often in defiance of preconceived or inherited opinions.

M. Souriau deals in turn with the inner life of the individual, family life, social life, and finally with the religious aspect of happiness; and while facing squarely, from the point of view of the trained philosophical thinker, the problems which incessantly beset all except the shirkers—who prefer to postpone them—arrives on the whole at a cheering, optimistic, and inspiring conclusion, which has been reached before by many earnest thinkers, though not by precisely the same path.

> "Enfin nous avons reconnu et compris que le bonheur n'est pas la fin suprême. Il est légitime; il est désirable en soi; mais il ne doit pas résumer et se subordonner toutes nos aspirations: il n'est pas le but de la vie. Il y a quelque chose qui vaut plus que la joie, et qui dans bien des cas ne peut être obtenu que par le renoncement à la joie: c'est la vérité, la justice, la bonté la dignité de la vie. Notre bien souverain, notre idéal ce que nous poursuivans de toutes les tendances instinctives ou conscientes de notre nature, ce n'est pas la béatitude qu'un plus grand développement peut nous procurer, c'est ce développement même. Il faut nous élever, de cœur et d'esprit. D'un premier effort nous arriverons au bonheur. D'un effort plus grand nous dépasserons le besoin de bonheur. Ainsi cette étude bien utilitaire en apparence, des conditions du plaisir et de l'art d'être heureux, aura été pour nous une leçon de désintéressement."

It is not our province to discuss M. Souriau's conclusions in detail. We merely hazard a wish that the professor had dealt with that mental attitude which finds pleasure in incongruity, and which we name humour. His conclusions on this element of happiness would have been interesting to many of us on this side of the Channel. We must, however, content ourselves with directing the attention of the large number of our readers who find pleasure in the best modern French literature to this new and deeply interesting volume, and with expressing a fervent wish that an English translation will appear in due course.

NEW BOOKS FOR TEACHERS OF PHYSICS.

The New Matriculation Light. The New Matriculation Sound. By R. W. Stewart, D.Sc. (Lond.). (University Tutorial Press.)

These volumes, written primarily for London Matriculation, are thoroughly sound text-books. In addition to the ordinary theoretical matter, each book contains a practical course of useful experiments, capable of being worked with simple and inexpensive apparatus—an important factor for the consideration of those private students who aspire to a London degree. The books are not merely text-books for examination purposes, but are written on thoroughly educational lines. The treatment of wave motion in the volume on sound is clear and concise, and the author with advantage might have utilised this as a basis for an additional chapter on the undulatory theory as applied to light.

Third Year's Course in Practical Physics. By J. Sinclair, M.A., B.Sc. (George Bell and Sons.)

This volume is the third of a series of elementary books on practical physics, and is devoted to a course in the study of light. The course outlined by Mr. Sinclair is interesting, and forms a good basis for further study. Our old friends, the pin experiments, again make their appearance. As a practical teacher the writer has found this method of demonstrating the properties of light thoroughly unsatisfactory for younger children. Surely it does not surpass the wit of the practical science teacher to devise simple forms of apparatus in which the child may deal with the actual beam of light, and not trust to an imaginary straight line vaguely termed by him a ray of light. Apart from this, the book merits nothing but praise. A feature likely to commend itself to teachers is the admirable set of questions and exercises to be found in the book.

A School Course in Light and Sound. By F. G. Endecott. (Blackie and Son.)

This book purports to be a course in light and sound intended to fulfil the requirements for the Oxford and Cambridge Junior Locals. Each chapter, we are told, represents a week's work (there are thirty altogether), and consists of lecture notes, notes on practical work, questions and exercises, and scholars' notes. Convenient blank spaces are left for the insertion of these profound products. The questions and exercises are wonderful examples of Socratic wisdom: "What is the axis of a lens?"—"Describe the siren"—"What is meant by 'pitch'?"—"Describe the kaleidoscope"—in short, the book is a veritable mine for the examiner in "general knowledge." "A good few" (we quote the author's own words) "of the exercises consist of experiments which should lead the scholar to discover certain facts for himself." In order that these valuable contributions may not be overlooked, the author kindly indicates them by a footnote.

A First Year's Course in Geometry and Physics. By Ernest Young, B.Sc. (George Bell and Sons. 2s. 6d.)

Mr. Young is a believer in the correlation of school subjects, and sees in the relationship of geometry and physics an excellent opportunity of putting his beliefs into practice. With this object he combines practical work in mensuration and measuring in the laboratory with the inculcation of geometrical truths. Educationally this is thoroughly sound, but in our opinion he fails somewhat when he tries to write a combined volume on geometry and physics. The fundamental properties of matter are much better taught to young children (we speak from experience) without the aid of a text-book, and any book which attempts to place these in a simple manner before the young mind is, after all, a very poor substitute for the skilled teacher. Mr. Young's course in experimental geometry is rational and sound educationally, but his course in physics we find very meagre, and venture to suggest that in the two and a half hours a week which he indicates should be devoted to physics teaching in the first year it is quite possible to do more than give a class an elementary knowledge of volumes, densities, and the simpler principles of hydrostatics. We also venture humbly to hope that the time has gone past when the teaching profession should be subjected to the following elementary instruction which we find in his prefatory note. "Take a given exercise. By means of properly directed questions elicit a complete answer from the class. Write these answers on the blackboard," etc. This is too reminiscent of the days of our youth.

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Our Students' Column.

THE PRELIMINARY EXAMINATION FOR THE CERTIFICATE.

Part II.—April 1908.

BY W. MACPHERSON, M.A.

TAKEN as a whole, the questions set in April were well conceived and rational. Some of the papers, indeed—such as those on English Literature and Geography—contained questions of a very high standard; but this can hardly be counted a fault, since in most of the papers candidates were allowed a sufficiently wide option of questions, and in setting the more difficult questions the examiners no doubt desired to emphasise the Board's intention of maintaining and perhaps raising in the future the standard of the examination.

The most important general inference which a candidate may draw from a consideration of the syllabus and the papers as a whole is that a merely mechanical knowledge of the subjects of examination will not enable him to satisfy the examiners. Each of the papers set presupposes the power of applying the general principles that form the basis of each subject. Mere book knowledge—the attempt to "learn" a subject by rote, without the intelligent application of what he learns—will not here carry a student far towards success.

The three compulsory subjects of Part II. are English Language and Literature, History, and Geography.

The most notable feature of the papers included under the first-named subject was the almost entire absence of questions in formal grammar; the papers were directed almost exclusively to testing the student's powers of composition and his first-hand knowledge of literature. If we speak strictly, there was but one question set in formal grammar—that on the analysis of sentences. The analysis asked for was not detailed but general—into clauses merely, and not into the component parts of the clauses. The second part of the question, however, required the candidate to state the functions of certain words, and to indicate their relation to other words in the passage quoted. The nature of this question (together with the fact that the candidate was asked not only to comment on the functions of the clauses and words, but also to give in his own language the *meaning* of the passage) emphasises the all-important truth that in the study of grammar we should concentrate our attention, not on merely grammatical distinctions as such—not so much on the external distinctions of accidence and inflection—but rather on the *functions* of words and clauses, on their relations to one another in sentences. The study of grammar, as it is now conceived by the intelligent teacher and examiner, is useful chiefly in so far as it enables us, in literature, to understand more accurately the *meaning* of what we read, and, in composition, to express more logically and idiomatically the content that we wish to express. So far as English grammar is concerned, then, candidates will do well to study mainly the part which is devoted to syntax (as it is given in any of the more advanced text-books, such as Meiklejohn's, or the book called *Matriculation English*), and to pay particular attention to the analysis of sentences.

The fourth question in the English Language and Literature Paper (I.)—namely, "Draw attention to characteristics of the above passage from which you would conclude that it is a poetical and not a prose extract. Rewrite it, so as to show its division into lines"—shows that candidates are expected to have some knowledge of the features of poetic diction and of the principles of metre and scansion. So far as the diction of the passage in question is concerned, the use of simile, alliteration, onomatopœia, and of such words and phrases as "ere," "awhile," "storing stormy thoughts," "let him die the death," indicates that the extract is taken from poetry and not from prose; and in a complete answer to the question these characteristics would be duly noted. Candidates are recommended to read the excellent chapter on "Poetic Diction" contained in Abbott and Seeley's *English Lessons for English People*. A sufficient knowledge of the principles of metre and scansion may be obtained from Meiklejohn's *English Grammar* or from the *Matriculation English*.

In the English Composition Paper candidates were given the choice of two subjects for essays—(1) "Dreams," and (2) "What notable invention, in your opinion, has contributed most to the happiness of mankind, and why?" The latter of the two subjects suggests that candidates would be well advised to keep abreast with such up-to-date information as is given on various subjects each month in the columns of the *Practical Teacher*.

In the Literature Paper five questions (out of twelve set) had to be answered, of which the first—dealing mainly with passages of lyric poetry—and either the second or third or fourth—dealing with Shakespeare's plays—were compulsory. The last-mentioned proviso implies that the careful study of a good anthology and of at least three or four of Shakespeare's plays must be undertaken by all candidates. The first question of the paper was a difficult one; it is of the standard which a few years ago would have been thought appropriate in the examination for appointments in the Indian Civil Service. The mere fact that it should now be considered a suitable question in this examination is a sufficient testimony to the advance that has recently been made in the conception and method of literature teaching. Questions (5) and (6) dealt with the Waverley Novels. Candidates, then, should read three or four of these, making, as they read, brief notes on the subject-matter and characters. Other authors on whom questions were asked were Bunyan (*The Pilgrim's Progress*), Goldsmith (*The Vicar of Wakefield*), Swift (*Gulliver's Travels*), Charles Reade (*The Cloister and the Hearth*), Dickens, Thackeray, Charlotte Brontë, Milton, Wordsworth, and Tennyson; but undoubtedly the most important authors for the purposes of this examination are Shakespeare, Scott, and the lyric poets (as they are represented in any adequate anthology, such as Palgrave's). Two questions on style and what may be called the theory of literature were set. In connection with this aspect of the subject candidates are recommended to read the two chapters on

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"Prose Diction" and "Poetic Diction" in Abbott and Seeley's *English Lessons for English People*.

The History Paper was remarkable for the large option of questions given—answers to eight questions out of thirty-nine were required. An obvious deduction that may be drawn from this paper is that candidates should study with a view to obtaining rather a full knowledge of two or three periods than a scanty and scrappy knowledge of the whole subject. The reading of the daily newspapers should not be neglected, as the seventh question shows: "Explain as accurately as you can the nature of the different kinds of armed forces maintained in this country, *and any recent changes that have been made in them*." The relation of cause and effect in all historical movements should not be overlooked, and the perusal of such notes as have appeared in recent issues of the *Practical Teacher*, under the heading of "Cause and Effect in History," will be useful as supplementing the more systematic and continuous study of the subject in this aspect. The relation of English to European history is also important, as is shown by questions (2), (8), and (31); and apart from its importance for this particular examination, the study of general history should be of special value to those who are to become teachers, on account of the close connection that it has with the history of education. The following passage from an article by Professor Welton in the recently-issued *Training College Record*—a new publication—is appropriate here: "More and more, teachers are recognising that a study of the history of England apart from that of the rest of Christendom cannot give true historical conceptions. Though the syllabuses for training colleges set forth by the Board of Education show as yet no trace of this fuller and more rational view, yet it appears in the Regulations for the Examinations of Pupil Teachers. Thus it may be hoped, and to some extent expected, that in the future students [of training colleges] will, in increasing numbers, have the appropriate system of knowledge into which the history of education fits, and wanting which it is impossible to teach it without continual excursions into general history."

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The papers that were set in the Optional Subjects call for little comment. In the Arithmetic and Algebra Paper a knowledge of short methods and rapidity of working will evidently gain a candidate marks. Ten questions of considerable length were set, but the paper was prefaced by the kindly hint that candidates should "begin with the questions that they can answer best." A merely formal and mechanical knowledge of arithmetical and algebraic processes will not avail a candidate much; he must study to acquire the power of applying practically the various rules in problems. The papers in Elementary Science serve to emphasise the fact that a *practical* knowledge of the subjects taken is required. The questions are obviously based on the supposition that candidates have performed for themselves a considerable amount of experimental and observational work. The French Paper is prefaced by the sensible remark that "the work will be judged by quality rather than quantity; attention should be paid to idiomatic expression in both translation and composition." Only one question on grammar was set, and it is clear that the examiners attach considerable importance to the ability of candidates to translate from English into French.

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English.

BACON himself analyses the essay on "Nobility" into two parts, saying, "We will speak of nobility first as a portion of an estate, then as a condition of particular persons."

The first part can be subdivided into two parts, showing respectively the advantages and disadvantages of a class of nobles in a state. The second states that an old-established nobility is worthy of reverence, and induces virtue in the later holders of it, although the founders may not have attained to their position by pure means. "Nobility abateth industry, and leads the lazy noble to envy the industrious plebeian. Nobles who can rise no higher envy those who can, but are not envied by others because they are in possession of honour." Kings can well employ capable nobles to help in governing, because nobility is a sort of stamp of superiority which is recognised by the common people.

Nobility in this essay means the class coming next to the king, and it is assumed that admission to the class is gained by descent in the great majority of cases.

Estate—that is, a state, or political unity. The word comes from the Latin *status* through the French, and it is interesting to note that the French have always found a difficulty in sounding an *s*, especially an initial *s*. To get over this difficulty, in old French an *e* was placed in front of the *s*. Hence we have in English many pairs of forms of the same words, one derived from the Latin directly and beginning with *s*, the other through the old French and beginning with *e*. For example—state, estate; specially, especially; stablish, establish; spy, espy. A still more extraordinary fact is that, after the *e* had been added in old French to facilitate the sounding of the *s*, the *s* dropped out but the *e* remained in the French word. For example, *état*, *établir*; so also in such French words as *étable* (from Latin *stabulum*), *étage* (a stage or floor of a house).

Tyranny, an absolute government. A tyrant was not originally an oppressor, but merely a governor without a limit to his power. He might employ his power in a beneficent manner, but the temptation to oppression was evidently so strong that the word has changed its meaning.

Attempers, modifies, mitigates. Bacon means that the existence of a class of nobles between the king and people prevents the king from oppressing his people.

Democracies. A democracy is a state in which the rule is in the hands of the common people, or *demos*. The remains of an old nobility in such a state is a source of trouble, as is shown by the history of Florence and other Italian states.

Indifferent, impartial, not making or recognising differences. The use of the word to mean "ordinary" or "mediocre" is quite modern. Compare the prayer, "That they may truly and indifferently minister justice."

Potent = powerful. The history of England illustrates the relation between the power of the nobility and the "majesty" and "power" of the sovereign. In the reign of Henry the Third the nobles were "too great for sovereignty." Under the Stuarts it did not form a sufficient protection for it. The last remark of the paragraph regards the nobility as an unproductive class. If nobles engage in business or commerce, Bacon would consider them to abandon their nobility.

Act of power. One of the prerogatives of royalty is the power to create or confer nobility. This is one of the many political notions that we have adopted from the Roman Empire. Thus the companions of the emperors were called *comites*, or counts.

It is reason = it is right that. Compare the French *vous avez raison*, "you are right."

Avoid motions of envy, keep clear of a tendency to envy. Members of an ancient noble family are often disposed to envy or disdain newly-created nobles. But, as Sallust says, this is very inconsistent, for they pride themselves on their ancestors, who, after all, obtained their nobility in the same manner as the men they envy.

Passive envy—that is, the envy which is passive, or suffered by the nobility. The statement is by no means always true, for nobles are very often objects of envy.

The essay on "Seditions and Troubles" is best arranged under four heads. (1.) Signs or symptoms of troubles. (*a*) Libels and false reports; (*b*) disposition to discuss commands rather than to obey them; (*c*) partiality in the sovereign. (This might have been given as a cause rather than as a sign.) (*d*) Shakiness of one of the four pillars of government—religion, justice, counsel, treasure.

(2.) Material on which sedition feeds. (*a*) Poverty; (*b*) political discontent.

(3.) Causes and motives of seditions.

(4.) The remedies. (*a*) Improving the general financial state of the people by (i.) opening and well balancing of trade; (ii.) encouraging manufactures; (iii.) banishing idleness and repressing waste; (iv.) improvements in agriculture; (v.) reducing taxation; (vi.) keeping the population, especially the unproductive part, within the limits of the means of subsistence offered by the country; (vii.) preventing the accumulation of wealth in the hands of a few. (*b*) Removing political discontent by (i.) preventing the union of discontented sections; (ii.) giving "moderate liberty" of complaint; (iii.) leading the people to hope for better times; (iv.) winning or reconciling the leaders of factions; (v.) avoiding hasty remarks that can be used by opponents; (vi.) having a trusty military leader at hand.

This essay was inspired by Machiavelli's *De Principe*, especially those parts in which political expediency is set out as the chief ground for action.

Equinoctia. March 21 and September 21, when the days are equal to the nights all over the world. At those times the sun crosses the equator, and causes modifications in the constant and periodic winds, such as the trade winds and monsoons, especially the latter. These changes are generally marked by violent storms. It is, however, quite a false analogy to say, because these storms occur when the nights are equal to the days, that political tempests "are commonly greatest when things grow to equality" among the different classes of society. A consideration of the French Revolution and other great upheavals will show that the violence of the movement is proportional to the *difference* between the conditions of the several classes of society. In her *Considérations sur la Révolution Française* Madame de Staël says: "Si les nègres à Saint-Domingue ont commis bien plus d'atrocités encore, c'est parce qu'ils avaient été plus opprimés."

Ille.....bella, he—that is, the sun—also often warns us that secret tumults are threatening, that deceits and hidden wars are breaking out. Virgil, *Georgics*, i. 465.

Hastily embraced. False news is not in itself a sign of political trouble. If the people have confidence in the government, they discredit such news; but they give ear to it if they have lost that confidence.

Illam.....progenuit, Mother Earth, irritated by the wrath of the gods, brought her forth, as they say, as the youngest sister to Cœus and Enceladus.

Fames, reports, rumours.

Conflata.....premunt, great envy being excited, people disparage what he has done, whether it be well or ill.

Neither doth it follow, etc. A strict censorship of the press and of public speech leads to the belief that the acts of the government will not bear the light.

Erant.....exsequi, (the soldiers) were at their post, but yet as if they preferred that the orders of the commanders should rather be discussed than obeyed.

Henry III. of France (1574–1589). The League was formed by Catholics who were disaffected towards the king. Henry thought to gain them over by proclaiming himself their chief. In this he was unsuccessful, whilst he embittered the Protestants. He was stabbed by a fanatical monk, Jacques Clément, while besieging Paris.

Liberius quam ut imperantium meminissent, too freely to be mindful of their rulers.

Solvam cingula regum, I will loosen the bands of kings. See Isa. xlv. 1.

Hinc.....bellum, hence came devouring usury, and interest rapidly increasing with the time; hence shattered credit, and a war that was profitable to many.

Dolendi.....item, there is a limit of grieving, but not of fearing.

Mate, match, or equal.

The causes and motives of seditions are.....cause. The student will not find it difficult to name political disturbances that have arisen from each of these causes. A list should be made.

Just cure, the right cure in each case.

Opening and well balancing of trade. The experience of this country has shown that as a whole trade advances best when left to balance itself.

Sumptuary laws. Note examples of these from your history.

Regulating of prices. Prices must be allowed to set themselves according to the supply and demand. Attempts to fix prices by law lead to hardship and injustice.

Stock, resources.

Overgrown clergy. This is exemplified in Italy, where about one person in every thousand is a member of some religious order.

Materiam superabit opus, the work is worth more than the material.

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Mines above ground. Here used figuratively for sources of wealth.

Good policy. The question of preventing the accumulation of vast wealth into the hands of a few is the one that is troubling American politicians at the present moment.

Muck, what is now known as "manure." Compare "bere mukke afelde"—that is, carry dung to the field (*Piers Plowman*, vi. 144). To "manure" a field meant originally to work it by hand (*manus* and *operare*).

Pernicious imposthumations, injurious abscesses.

Prometheus and *Epimetheus*, according to the Greek legend, were brothers. Their names signify respectively "forethought" and "afterthought." Prometheus benefited mankind by stealing fire from heaven; but he thereby angered Jupiter, who in revenge caused a woman to be made. She received a gift from each of the gods, and was hence called Pandora—that is, the all-gifted. Epimetheus was persuaded by Mercury to take Pandora as his wife, and he opened a box that she brought with her, and thereby allowed to escape from it the contents, which comprised every human ill. When too late Epimetheus shut down the lid, and thus retained the last article in the box—namely, Hope. Some say that the box contained human blessings, that flew away when the box was opened, and this agrees more with the retention of Hope.

Political programmes, and even "Kings' Speeches," often seem to be drawn up with a view to giving the people something to hope for.

Sylla.....dictare. Sylla did not know his letters, and therefore could not dictate. But *dictare* means also "to rule," "to be a dictator."

Legi.....emi, a soldier was to be chosen by him, and not bought. As the Roman soldiers were accustomed to rewards for their services, they understood this to mean that such payments would not be forthcoming, and they accordingly killed Galba in A.D. 69.

Si vivero.....militibus, if I live, the Roman Empire will have no more need of soldiers. This remark offended the army, and Probus was killed by his soldiers (A.D. 282).

Atque.....paterentur, but the condition of men's minds was such that a few dared to do this very wicked deed, more wished to do it, all tolerated it.

Elementary Science.

Notes of a lesson on the parts of a plant.

Preparation.—Dig up one or two typical plants by the roots, gently shake off the soil, and remove any that should still adhere to the roots by shaking under water. Ask the children to name the parts, and question in order to see how much they know of the forms and uses.

Presentation.—(*a*) *The Root.* As a rule this consists of a thin, tapering rod, more or less branched—for example, the bean, dandelion, wallflower. In other cases it consists of a bundle of thin, hairlike mass. The former type is known as a *tap-root*, the latter are known as *adventitious* roots. Adventitious roots are often given off by stems which "strike root," as the ivy and strawberry plant.

The first use of the root is to fix and hold the plant firmly in its place. In the case of many marine plants this is the only use. Pieces of seaweed may often be seen attached to the surface of hard rock, and pieces of broad ribbon-weed are frequently washed ashore with the stone to which they are fixed. Such an object should be placed in the school museum, as it is a useful illustration in teaching. The next use is to absorb moisture, which it generally does from the damp ground in which the plant grows. In some cases—for example, certain orchids—there are aerial roots which have the power of absorbing water from damp air. The only solid matter the plant takes in by its roots is the mineral matter which is dissolved in the water.

In some cases the root serves as a storehouse for nourishment. This is particularly the case with biennial plants, such as the carrot, turnip, and beet. These show comparatively little growth above ground during the first year, but a large quantity of starch and other matter is stored up in the root, which enables the plant to develop vigorously during the second year, when it sends up a tall stalk, which bears first flowers and then seeds. If the root of a carrot be examined before and also after the plant has "run to seed," it will be found that the root undergoes a great diminution during the interval.

Many roots are of use to man, in most cases on account of the nourishment stored up in them. Some of these are eaten whole, as the carrot; others yield foodstuffs after treatment—for example, arrowroot, tapioca. Some yield drugs, as rhubarb and liquorice; others yield dyes, such as madder.

(*b*) *The Stem.*—This serves as a support to the leaves and flowering parts, which it keeps at a healthy distance from the ground. Generally the stem is stiffened by the formation of woody material, which enables it to stand alone. But this is not always the case, for we have some stems, or *stolons*, which creep along the ground, as the creeping-jenny and the strawberry. Sometimes the stem actually grows underground, in which case it is called a *rhizome*—for example, the bracken. An underground stem frequently gives rise to swellings known as *tubers*—for example, the potato. Rhizomes and tubers frequently serve as storehouses. They are distinguished from roots by the fact that they can give rise to leaf-buds, which a root does not.

Some stems are not sufficiently strong to maintain an erect position by themselves, and they require the support of other plants. This they obtain in many cases by means of spines and thorns with which they are furnished. When the spines of a plant are used for climbing, it will be noticed that they always point backwards. Owing to this arrangement, whenever the wind causes a motion among the bushes in the midst of which such a plant is growing, it tends to make the stem advance more and more, as the spines will not allow it to go back when once it has advanced; and thus the plant is able to surpass its companions, and to enjoy the light and air which its weak stem would not have enabled it to reach. Some plants, again, with weak stems are supported by means of tendrils which grow on the stem or on the leaves. On reaching a certain stage in their development, they curl up and hold tightly to small branches of neighbouring plants. In this way the Virginia creeper, bryony, pea, and many other plants are able to make up for the weakness of their stems. Other plants, again, of which the bean is an example, effect their climbing by twining round a support. The manner in which this is done is very interesting; and as the bean is specially named in the syllabus, the way in which its stem twines should be made the subject of careful observation and experiment. Sow a scarlet-runner bean in the middle of a flower-pot, and when it is about fourteen or fifteen inches high drive a stick into the pot, so that it may be quite close to the bean stem and reach about six inches up it. Tie the stalk to the top of this stick, and there will be eight or nine inches of stalk unsupported. Owing to the weakness of this stem it will droop over to one side. Stand the pot on a drawing-board, and with the help of a small weight tied to a thread make a mark on the board on the spot which is vertically under the end of the bean stem. Leaving the pot on the board, make a similar mark at the end of a quarter of an hour. It will be found that the two marks do not coincide; and if the observation is repeated at intervals of ten minutes or a quarter of an hour, it will be shown that the growing point describes a complete circle. The temperature should be noted. If it is about 75°, the growing point describes its circle in about three and three-quarter hours, and at a higher temperature the revolution is more rapid, so that at 90° the time is only a little over two hours and a half. If another stick be placed in the pot, projecting, say, eighteen inches or two feet, as the bean stem revolves it will touch this, and at the point of contact its motion will be arrested; but the upper part will continue to revolve, and so it will twine round the stick. It should be noted that the bean revolves in the opposite direction to the hands of a clock; but some plants, such as the hop, revolve in the same direction.

In some cases nourishment is stored up in the stem.

Association.—Contrast the forms and uses of the root and stem.

Application.—Examine as many roots and stems as possible, and make notes of the differences found in them.

THE NEXT PRELIMINARY CERTIFICATE EXAMINATION.

Sir,—As the concession given in the following letter which the "Normal" has just received from the Board of Education will be a great boon to hundreds of your readers, we have much pleasure in sending this letter for insertion in your paper.

This letter means, of course, that all who have failed in Part II. of the recent Preliminary Certificate Examination will *not* be required to take Part I. again.—Yours, etc.,

P. Lyddon-Roberts and E. E. Denney,
Principals of the Normal Correspondence College.

"Sirs,—I am directed to inform you that the Board of Education have now decided that candidates who passed Part I. of the Preliminary Examination for the Certificate 1908 in December 1907 may be admitted to Part II. of the Preliminary Examination for the Certificate 1909, even though they have not passed Part I. of the latter examination.—Your obedient servant,

"R. G. Mayor."

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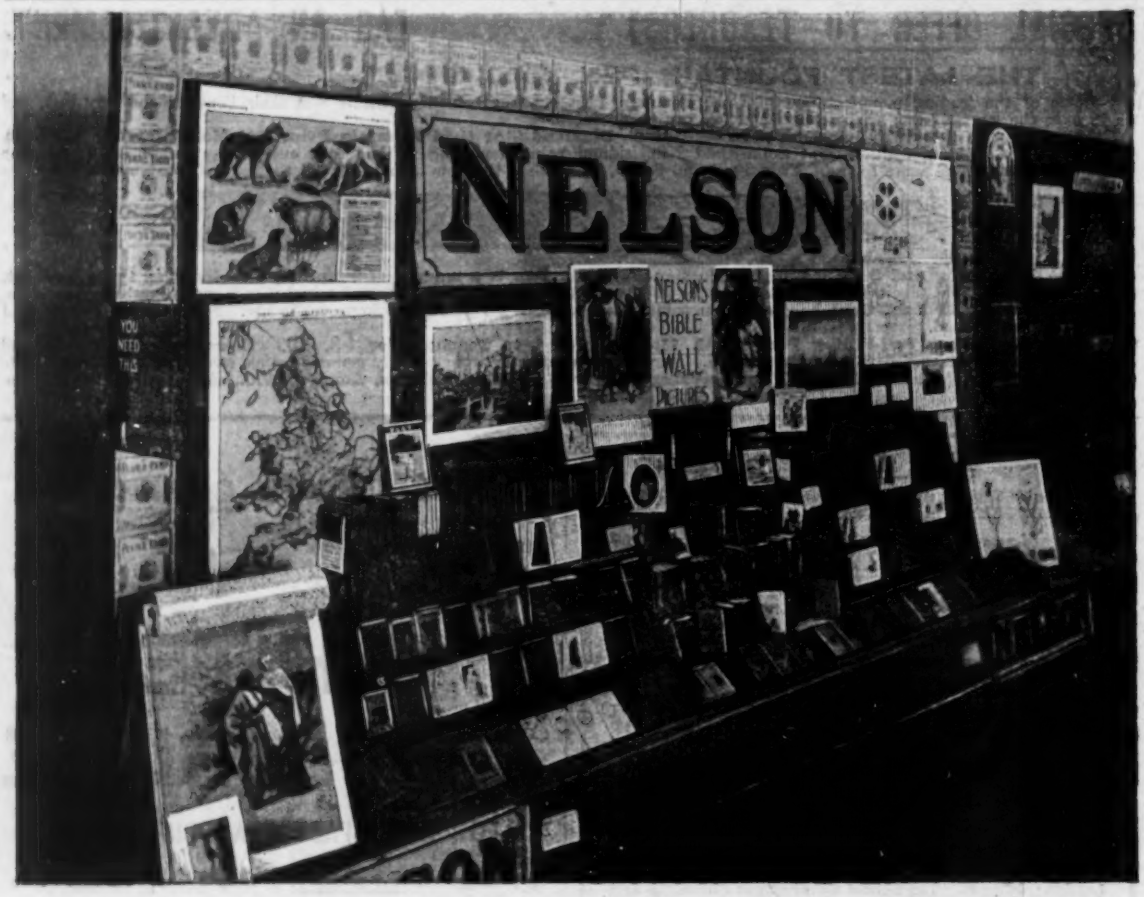

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